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REPORT UPON INVESTIGATIONS
RELATING TO THE
TREATMENT OF LUMPY-JAW

SALMON

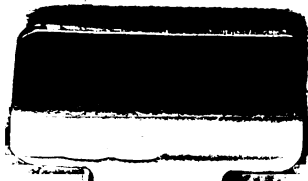
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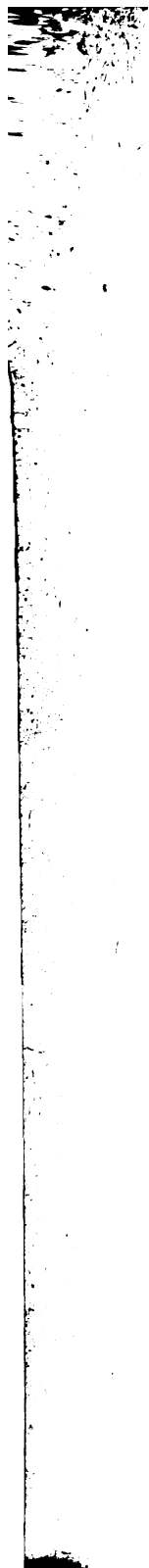
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U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF ANIMAL INDUSTRY.

BULLETIN No. 2.

REPORT UPON INVESTIGATIONS

RELATING TO THE

TREATMENT OF LUMPY-JAW,

167536

OR

ACTINOMYCOSIS, IN CATTLE.

BY

Dr. D. E. SALMON,

CHIEF OF THE BUREAU OF ANIMAL INDUSTRY.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF AGRICULTURE.

WASHINGTON:

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TABLE OF CONTENTS.

	Page.
Report upon investigations relating to the treatment of lumpy-jaw in cattle..	7
Review of the work.....	7
Injustice to the owners of lumpy-jaw cattle	22
The jurisdiction of the Illinois Board of Live-Stock Commissioners over animals affected with lumpy-jaw.....	24
Experiment to test the contagiousness of actinomycosis	30
Does the iodide treatment drive the disease to the internal organs?	31
The cost of treatment.....	34
Successes obtained by individuals with the iodide treatment.....	35
Report of Dr. V. A. Norgaard, inspector in charge.....	39
The medicine.....	39
Effect of iodide of potassium on the different actinomycotic new forma- tions and their tissues.....	41
Individuals which show the most pronounced symptoms of iodism will im- prove the fastest.....	43
Post-mortem examination	46
Appendix.....	47

LETTER OF TRANSMITTAL.

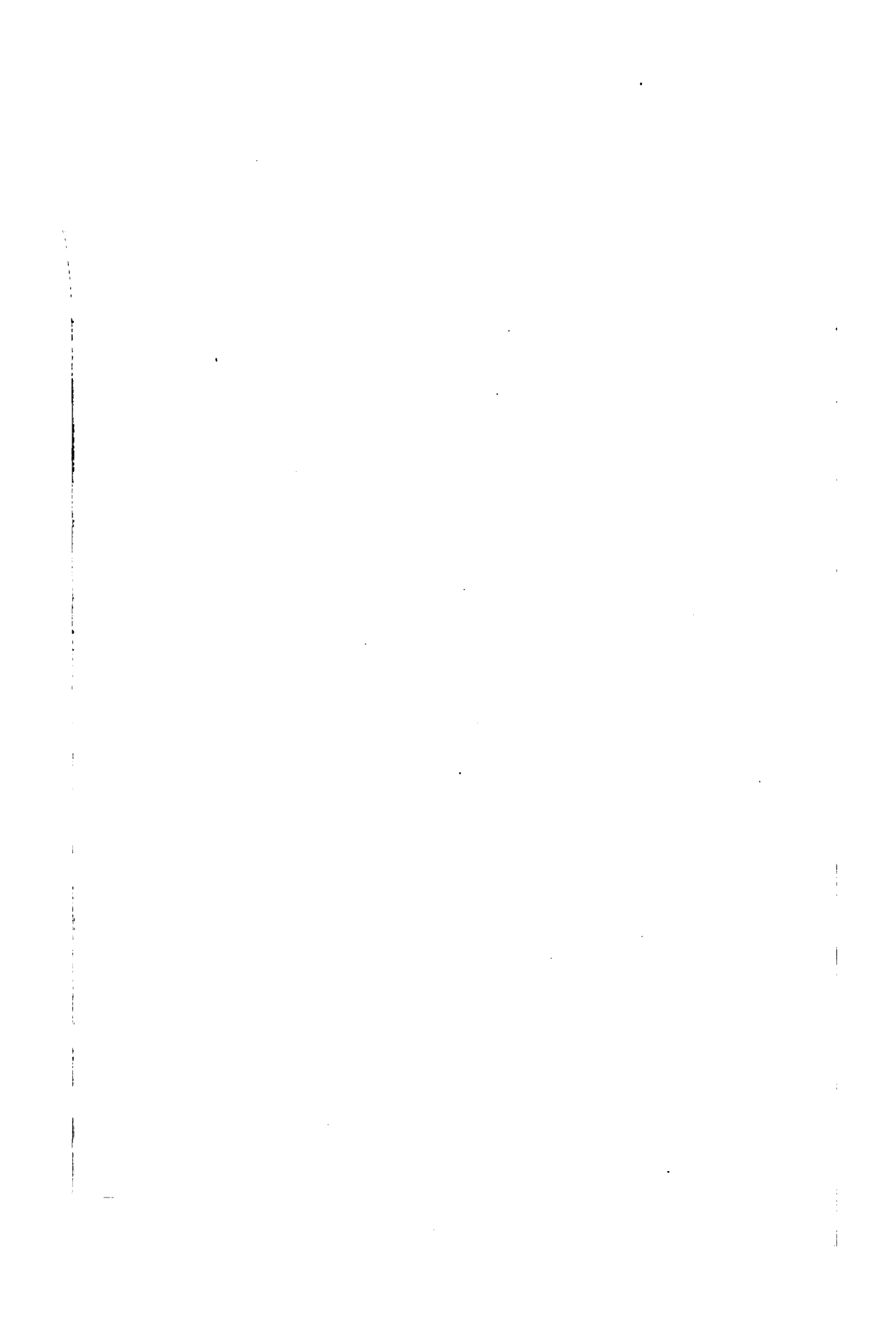
U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., February 10, 1893.

SIR: I have the honor to transmit for publication the following report upon investigations relating to the treatment of lumpy-jaw, or actinomycosis, in cattle, together with a detailed report upon the experiments conducted at Chicago by Dr. V. A. Norgaard, to whom was assigned the personal supervision of the work.

Very respectfully,

Dr. D. E. SALMON,
Chief of Bureau of Animal Industry.

Hon. J. M. RUSK,
Secretary of Agriculture.



REPORT UPON INVESTIGATIONS RELATING TO THE TREATMENT OF LUMPY-JAW, OR ACTINOMYCOSIS, IN CATTLE.

REVIEW OF THE WORK.

Since 1889 the disease of cattle known scientifically as actinomycosis, and popularly as "lumpy-jaw," has attracted much attention in the United States on account of sensational publications alleging its great prevalence and dangerously contagious character. The Illinois board of live-stock commissioners appears to have been the first to accept this view and the most active in promulgating it. Since 1888 that board has seized and slaughtered a large number of animals both at the Union Stock Yards at Chicago, and at the National Stock Yards at East St. Louis. As there were included among the animals seized many in the best of condition and but slightly affected, and as these were turned over to parties for rendering purposes who allowed to the owners for a long time less than one-third of what the carcasses were worth even for that purpose, there was naturally much dissatisfaction created. It was claimed that, in addition to the unnecessary and unjust loss on affected animals which the owners were compelled to suffer, the inspection was not uniform; that many affected animals were not siezed; that those badly affected were in some cases passed by the inspectors as fit for food, while in other cases those but slightly affected and in good condition were sent to the rendering tanks. More than this, the contagiousness of the disease among animals and the danger of its transmission to man, as well as the jurisdiction of the State board of live-stock commissioners in assuming the duty of meat inspectors were seriously called in question.

The Bureau of Animal Industry was confronted with this condition of affairs when it began the inspection of meat at Chicago under the act of Congress approved March 3, 1891. The shippers of cattle at once made numerous complaints of the arbitrary, arrogant, and unjust manner in which the State board was acting, and, on the other hand, the board attempted to dictate to the Department as to what carcasses should be condemned by its inspectors and what passed as fit for food. It became necessary, therefore, that this Bureau should make an investigation as to the facts and take such action in its own work as would secure justice to the cattle owners, and at the same time pro-

tect the consumers of meat from any carcasses that were in the slightest degree dangerous to the public health.

The matter has been a difficult one to adjust because there existed, on the one hand, a board which has not hesitated to make the most sensational assertions, alarming to the consumers and damaging to the meat trade of the country, and on the other, a body of consumers exacting as to the quality of their food, sensitive to any aspersions upon it, and disposed to ask the destruction of meat though perfectly wholesome, if a breath of suspicion had been directed against it. This disposition of consumers, and the desirability of protecting the public health at any cost, no doubt accounts for the ability of the board to maintain its seizures for so long a time, though they were generally recognized as unjust, and suspected to be without legal authority.

In the spring of the year 1892, the attention of the Department was called to a remedy which appeared to have extraordinary effects in the treatment of this disease. An experiment was made on a single steer, which was badly affected, by Dr. Norgaard, an inspector of the Bureau of Animal Industry, and this steer was completely cured.

The following announcement was then made for the information of those interested in this subject:

The interest which has been shown by the stockmen of the United States in regard to the disease known as "lumpy-jaw," or that form of actinomycosis which appears as external swellings on the head, renders it desirable that a preliminary statement should be made concerning the treatment of this disease. Until recently it has been the opinion of the veterinary profession that a cure could only be obtained by a surgical operation, and that this should be performed in the early stages of the disease in order to insure success.

In March last an important contribution to our knowledge of this subject was made by M. Nocard, of the Alfort Veterinary School, in a communication to the French Central Society of Veterinary Medicine. He showed clearly that the actinomycosis of the tongue, a disease which appears to be quite common in Germany and is there known as "wooden tongue," could be quickly and permanently cured by the administration of iodide of potassium. M. Nocard calls attention to the success of M. Thomassen, of Utrecht, who recommended this treatment as long ago as 1885, and who has since treated more than eighty cases, all of which have been cured. A French veterinarian, M. Godbille, has treated a number of cases with the same remedy, all of which have been cured. M. Nocard also gives details of a case which was cured by himself.

All of the cases referred to were actinomycosis of the tongue, and no one appears to have attempted the cure of actinomycosis of the jaw until this was undertaken by Dr. Norgaard, veterinary inspector of the Bureau of Animal Industry. He selected a young steer in April last, in fair condition, which had a tumor on the jaw measuring 15½ inches in circumference, and from which a discharge had already been established. This animal was treated with iodide of potassium, and the result was a complete cure, as stated in the reports which were recently given to the press at the time the animal was slaughtered in Chicago. If lumpy-jaw can be cured so easily and cheaply as this experiment would lead one to suppose, the treatment will prove of great value to the cattle-raisers of the country. As is well known, there is a considerable number of steers weekly coming to our markets which are condemned because they are diseased to such an extent that the general condition of the animal is affected. If these could be cheaply and readily cured by the owners, it would

prevent the loss of the carcass and solve all the troublesome questions which have been raised in regard to the condemnation of such animals.

The curability of the disease does not affect the principles which have been adopted in inspecting and condemning animals affected with it. This Department has never considered it necessary to condemn animals affected with actinomycosis on account of the contagiousness or the incurability of the disease. Such condemnations have been made when the disease was so far advanced as to affect the general condition of the animal, and all such carcasses would be condemned whether the disease from which the animal suffered was contagious or not, or whether it was curable or incurable.

The treatment with iodide of potassium consists in giving full doses of this medicine once or twice a day until improvement is noticed, when the dose may be reduced or given less frequently. The size of the dose should depend somewhat upon the weight of the animal. M. Thomassen gives $1\frac{1}{2}$ drams of iodide of potassium daily in one dose dissolved in a pint of water until improvement is noticed, which, he states, is always within eight days. Then he decreases the dose to 1 dram. The animals do well under this treatment, showing only the ordinary symptoms which follow the use of iodine, the principal ones being discharge from the nose, weeping of the eyes, and peeling off of the outer layer of the skin. These symptoms need cause no uneasiness, as they never result in any serious disturbance of the health.

M. Godbille has given as much as 4 drams (half an ounce) in one day to a steer, decreasing the dose half a dram each day until the dose was $1\frac{1}{2}$ drams, which was maintained until the twelfth day of treatment, when the steer appeared entirely cured.

M. Nocard gave, the first day, $1\frac{1}{2}$ drams in one dose to a cow; the second and succeeding days a dose of 1 dram in the morning and evening, in each case before feeding. This treatment was continued for ten days, when the animal was cured.

Dr. Norgaard gave $2\frac{1}{2}$ drams, dissolved in water, once a day for three days. He then omitted the medicine for a day or two, and continued it according to symptoms. These examples of the treatment as it has been successfully administered by others will serve as a sufficient indication for those who wish to test it.

Experiments are now being conducted on a large scale by the Bureau of Animal Industry in the treatment of lumpy-jaw with this remedy, and the results will be published as soon as possible. In the meantime it would be well for all who have animals affected with this disease to treat them according to this method, and report results to the U. S. Department of Agriculture, Washington, D. C.

Arrangements were made at as early a date as possible to test the remedy on a large scale with the affected animals as they came to the Union Stock Yards at Chicago. As the State board was still exercising its assumed power to seize, quarantine, and slaughter affected animals, they were requested to release from quarantine all such animals arriving during the time necessary to collect the number which was desired for the experiment, and allow them to be taken without interference to the stables where they were to be fed and treated. This they agreed to do.

No sooner, however, was an attempt made to collect affected animals for the experiment than it was reported by the inspector of the department at Chicago that the State veterinarian was passing all these animals as fit for food except those in the very worst stages of the disease. This change in the policy of the State board made it difficult to obtain the necessary cattle for treatment, but some were collected, and these the board put in quarantine, so that they could not be taken out of the

stock yards. This action made it necessary for the Secretary of Agriculture to call upon the governor of Illinois for his interference, which was done in the following telegram:

Gov. J. W. FIFER,
Springfield, Ill.:

VIROQUA, WIS., *August 23.*

Have received following telegram from Dr. Melvin, in charge of meat inspection at Chicago: "Stock Yards Company refuse to allow cattle to go out of yards on orders issued by you or myself. Baldridge will have carload by Wednesday. They will only recognize orders of the State." Will you please instruct your live stock board to allow us to ship out all cattle for experiments in lumpy-jaw? I am anxious to have cattle in all stages of disease for experiment by Department's remedy. I am now two weeks behind in this work on account of not being able to procure cattle, and if I am to be subjected to further delay I will have to go to Kansas City to make experiments. Answer here.

J. M. RUSK,
Secretary of Agriculture.

To this request Governor Fifer replied in two telegrams, as follows:

Hon. J. M. RUSK, *Secretary of Agriculture,*
Viroqua, Wis.:

SPRINGFIELD, ILL., *August 23.*

I have directed the Illinois live-stock commissioners to allow your agents to ship cattle diseased with lumpy-jaw for experiments by your Department, as requested by you.

JOSEPH W. FIFER.

Hon. J. M. RUSK, *Secretary of Agriculture,*
Viroqua, Wis.:

SPRINGFIELD, ILL., *August 29.*

I am advised that the United States officials have full charge of the cattle in question, for the purpose of experiment, and are only held responsible for their safe-keeping. The officials of this State are seeking to exercise no control over them beyond this. Is not this satisfactory?

JOSEPH W. FIFER.

After the governor's assistance had been secured, the animals purchased were allowed to leave the yards for treatment, and a better class was obtained, but the influence of the State veterinarian was still exerted to prevent the Department from collecting the milder cases. Although animals so affected had been freely condemned before, they were now said to be either free from the disease or perfectly fit for food. Under such circumstances the owners naturally preferred to sell their affected animals on the market included in the lots with which they had been shipped.

Notwithstanding the obstacles put in the way of the experiment, 180 animals, in various stages of the disease, were finally collected and put under treatment. No sooner had the first lots arrived at the stables than they were placed in quarantine by order of the Illinois board of live-stock commissioners. This hostile action was also laid before the

governor by the Secretary of Agriculture, and on September 14 the quarantine was withdrawn by order of the governor. The following is the correspondence in the case:

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., September 6, 1892.

SIR: Allow me to thank you for your assistance in securing for me animals affected with actinomycosis for the purpose of experimenting with the same with a view to curing this disease.

As I telegraphed to you, your live-stock commissioners, immediately after I obtained these animals, placed upon them an order of quarantine, and I now write replying to your telegram asking whether said quarantine would in any way interfere with my experiments in this direction. I desire to call your attention in this connection to one or two facts. One of the purposes for which the Bureau of Animal Industry of the Department of Agriculture was organized was to investigate the diseases of domestic animals and to endeavor to ascertain the causes of the same and "means for the prevention and the cure" of animal diseases. At the same time, the Bureau was, by its organic act, empowered to extirpate all contagious and communicable diseases among the domestic animals of the United States and to enforce all necessary measures to prevent their spread. These being some of the purposes for which the Bureau was organized, it would seem that when it undertakes to carry on an experiment with a view to discovering a cure for some certain disease, that all necessary measures to prevent any danger of the spread of such disease from animals being experimented on would be provided by the officers of the Bureau. For a State board, therefore, to place in quarantine animals being experimented upon by the Department of Agriculture is not only unnecessary, but has the appearance of being discourteous. It is a reflection upon the honesty and ability of the officers of the Department. It is not to-day believed by any competent person that actinomycosis, the disease with which the animals that are now being treated at Chicago are affected, is a contagious disease, or that there is any danger of its being communicated from one herd of cattle to another or to people. There is consequently no danger to be apprehended from the animals now in the possession of the Department at Chicago undergoing treatment. The great public benefit sought to be obtained by the experiment is such that it should not be interfered with or impeded by hostile acts of State officers. It would seem as if State authorities should coöperate in every way possible towards the successful accomplishment of such a purpose, and not, from jealousy or other cause, seek to prevent its success. The quarantine placed upon these animals, which the National Government has bought and paid for and which are now its property, is to me exceedingly irksome, and I consider it almost a personal insult; not only that, but, in my judgment, it is an illegal quarantine, so far as it applies to the work which is being carried on by the Department in the State of Illinois. The Department of Agriculture is operating in Illinois under the provisions of the act of Congress of May 29, 1884, and of the act of the State of Illinois of June 28, 1887, and under these acts it is beyond the control or interference of State officials.

I would further say that in conversation with Mr. C. P. Johnson, secretary of the board of live-stock commissioners of the State of Illinois, I was informed by him, in a very gentlemanly manner, that the reason of this quarantine was that there was some liability on the part of the State in case any disease should be spread from these animals. I have to assure you that there is no such liability, and whatever liability there might possibly be is assumed by the National Government, and that the law of Illinois above referred to expressly provides in section 3 that the State shall not be liable for damages or expenses of any kind under the provisions of the

same, and that this Department will hold itself responsible for any damages that may be inflicted by reason of the experiment which is now being carried on.

This experiment is being watched with a great deal of interest, not only by the stock-owners of the State of Illinois, but by the stock-owners of the entire United States, for, in case it proves successful, it will be of great benefit to all owners of cattle. I feel assured that I will have your best efforts to prevent any impediments being placed in my way in carrying the experiment to a successful end, and I would therefore request that you will kindly have the quarantine order made by the live stock commissioners of your State at once rescinded.

Trusting that this request will meet with your approval, I am,

Very respectfully,

J. M. RUSK,
Secretary.

His Excellency JOSEPH W. FIFER,
Governor of the State of Illinois.

SPRINGFIELD, ILL., September 14.

Hon. J. M. RUSK,
Secretary Agricultural Department, Washington, D. C.:

The live-stock commissioners of this State will remove quarantine from the diseased cattle your Department is experimenting on in Chicago, as requested in your letter to me.

JOSEPH W. FIFER.

On November 29, 1892, eighty head of the cattle which had been under treatment were shipped to Chicago and slaughtered. There were two lots of forty each. The first lot was supposed to be nearly or quite all cured, while the second lot was made up of the worst cases, many still having large swellings upon their heads, which were believed to be incurable. By direction of the Secretary of Agriculture, the following notice was mailed to the governor:

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Chicago, Ill., November 26, 1892.

DEAR SIR: I am directed by Hon. J. M. Rusk, Secretary of Agriculture, to inform you that a portion of the cattle which have been under treatment for actinomycosis or "lumpy-jaw," will be slaughtered at the slaughterhouse of Jacob Hess, Union Stock Yards, Chicago, on Tuesday, the 29th instant. The Secretary will be pleased to extend every facility for examination to any inspectors or others whom you may desire to have present on that occasion.

Very respectfully,

D. E. SALMON,
Chief of Bureau.

Hon. JOSEPH W. FIFER,
Governor of Illinois,
Executive Mansion, Springfield, Ill.

There were present on the part of the State Mr. H. McChesney, of the Illinois board of live-stock commissioners; Mr. Johnson, the secretary of the board; Dr. Casewell, State veterinarian, and Drs. A. H. Baker and Joseph Hughes, assistant State veterinarians. There were

also present on the part of the city, Mr. Pierce and an assistant. The inspectors representing the Bureau of Animal Industry who were present were Dr. A. D. Melvin, inspector in charge at Chicago, and Drs. Lewis R. Baker and Victor A. Norgaard, all being under the direction of the Chief of the Bureau of Animal Industry. Dr. Melvin was instructed to make the inspection carefully, and condemn all carcasses about which there could be any doubt as to their fitness for human food.

When the slaughter began, the State veterinarian assumed to be in charge of the inspection; he put his assistants on the floor, and with them examined the various organs of the animals, cutting them open, and in some cases removing them before they were seen by the inspectors of the Bureau, and even, in some instances, directing the removal of such organs by the workmen of the slaughterhouse before they had been seen by Dr. Melvin, and without any consultation with the Chief of the Bureau, who was constantly present. Several times it was necessary to go to Mr. Hess, at whose slaughterhouse the animals were killed, and ask him to instruct his men not to remove the organs of any animals from the killing floor or from places where they could be identified, until Dr. Melvin had given his consent to such removal. A number of students of the Chicago Veterinary College, at which institution the two assistant State veterinarians mentioned are professors, had been brought there to witness the slaughter without the knowledge or consent of the Chief of the Bureau. A number of newspaper correspondents were also present, and as they did not get their information of the killing from anyone connected with the bureau, it is assumed that they were informed by some one connected with the State board. The result of so many persons being present who were unexpected was that the floor was crowded; the inspectors were obliged to work under difficulties, and it was only by exercising constant vigilance that the organs of the animals were examined before they were removed from the position where they could be identified with the carcass from which they came.

As long as these animals belonged to the Department of Agriculture, and were being slaughtered under its direction, it certainly was no more than courtesy demanded that those in charge should have been consulted before information was given to so many persons not officially connected with the State, in order that it might be determined whether or not their presence would interfere with the proper performance of the work in hand. In addition to this, those present on the part of the State did not hesitate to speak disparagingly of the experiment, freely stating that they were condemning as large a proportion of these carcasses as were condemned from the "lumpy-jaw" cattle which come to the stockyards and are slaughtered without treatment.

At the close of the day's inspection the State veterinarian, without consulting with the Chief of the Bureau or with Dr. Melvin, or with-

out informing the representatives of the Bureau what he had done, gave a certificate to the inspector present on the part of the city to the effect that eighteen carcasses which had been passed by the inspectors of the Bureau of Animal Industry, and tagged with the meat-inspection tag of this Department, were affected with actinomycosis. As a result of this the Chief of the Bureau was notified by the city inspector that these carcasses could not be sold for consumption in the city of Chicago.

It should be stated that, during the whole day, in spite of the offensive action above mentioned on the part of those representing the State, these gentlemen were treated with every courtesy and given every facility for making their examinations, and no disagreeable word was spoken in their presence by any one representing this Department.

The inspectors of the Bureau of Animal Industry condemned every carcass in which a lesion was found which was of sufficient importance to justify the least suspicion that the carcass would be affected by it. None of the eighteen carcasses passed by the United States inspectors and condemned on the certificate of the State veterinarian were affected in such a way as to cause any suspicion in the minds of any of the representatives of this Department as to the perfect wholesomeness of the carcass. The lesions in all were very small, in one case not being larger than a grain of wheat, and in every case being insignificant. In a number of the cases these lesions, when examined microscopically, were found to be free from the actinomyces fungus, and, consequently, in these cases, there was an error of diagnosis on the part of the State veterinarian. I have been informed by Dr. Melvin that cases with much larger lesions than existed in any of the eighteen cases mentioned have frequently been passed by the State veterinarian in his inspections at the stock yards and allowed to go on the market as fit for food. If the statement is correct, which was freely made, that no larger proportion of these carcasses were passed than were ordinarily passed among the lumpy-jaw animals which come to the stock yards, that of itself is sufficient evidence that the carcasses about which this unfortunate difference of opinion exists should have passed, because no animal without greater lesions than many of these had would have been held for examination.

From the statements made above it will be seen that the inspection made by the inspectors of this Department was entirely ignored, and that the State representatives, who were present by the courtesy of the Department and who have no responsibility as meat inspectors, assumed authority to certify as diseased the carcasses of animals belonging to the Department which the Government inspectors declared to be entirely fit for food. Considering all these circumstances, and particularly that Government property was at stake which these gentlemen had shown their determination to cause to be destroyed by misrepresentation, I decided that it was no longer my duty, either on the

grounds of courtesy or by any previous arrangement which had been made, to invite their presence when other animals belonging to the Government were to be slaughtered.

It may not be out of place to mention in this connection the fact, already referred to, that at the time these animals were being purchased the representatives of the State board apparently did everything in their power to prevent the collection of a sufficient number of animals for this experiment, and that in order to accomplish this, affected animals, such as had previously been condemned, were freely passed as fit for human food.

I am free to state that the disease with which these animals were affected when they were purchased for experiment—that is to say, actinomycosis or “lumpy-jaw”—can not properly be considered as a contagious disease, requiring any such action to prevent its spread as being taken by the Illinois board of live stock commissioners. If the disease is contagious at all, which is doubtful, it certainly is not contagious to the degree which requires measures to prevent its dissemination by animals in transit for slaughter. There is no satisfactory evidence that it can be disseminated by animals mingling with each other in cars or yards, and it is even doubted by recognized authorities if it can be transmitted by inoculation, on account of the many failures which have been recorded.

In the International Congress of Hygiene and Demography, held at London a year ago, there was unanimity of opinion to the effect that there was no danger of this disease being transmitted to persons who used the flesh of animals so affected for food, and, so far as I remember, I was the only member of that congress who sanctioned the condemnation of carcasses of animals affected with this disease, except when it was disseminated throughout the body, and my position was that this was only justified when the malady had made such progress as to have affected the general health of the animal, as shown by loss of flesh or by large suppurating abscesses. In no other country than the United States, so far as our information extends, are carcasses condemned as unfit for food when locally affected with the actinomyces fungus, provided the animal was in good health and in good condition of flesh when slaughtered. The action of the Illinois State live stock commission in deciding this to be a dangerously contagious disease and in forcing affected animals with even slight lesions to be destroyed as unfit for food is, in my opinion, unjustified as a measure to prevent the spread of disease, and is a great wrong to the cattle producers of this country. There is no doubt that many thousands of dollars' worth of property have been unjustly taken from the cattle owners by such action. This would be the case, even if animals slightly affected were passed, as it is understood they have been in many cases. If, on the other hand, animals are to be condemned for the same reasons for which the eighteen carcasses above mentioned belonging to the Govern-

ment were condemned, then a much greater number of animals would necessarily be sacrificed. If a great department of the National Government can not secure justice in the inspection of animals belonging to it, when it has the undoubted authority to make such inspection with its own inspectors, then the individual shipper certainly has a very small chance to secure justice in the handling of his product.

In conclusion, I would ask attention to the fact that the Union Stock Yards of Chicago is one of the channels of interstate commerce; that the cattle received there do not come from the State of Illinois alone, but from nearly every State of the Union; that this is not their final destination, but that many of the animals and most of the products are shipped from there to other States. From these reasons it would appear that the United States Department of Agriculture should have jurisdiction in such yards, both to prevent the spread of contagious diseases and to insure a just and uniform inspection of animals and meats.

The experience in the slaughter of the animals belonging to the Department, and the action taken by the State veterinarian, evidently under the direction of the board of live stock commissioners, convinces me that there is much truth in the charges of arbitrary and inconsistent condemnation, and that something should be done by the United States Government to secure justice to the many cattle owners in various parts of the country, who are under the necessity of shipping their cattle to the Union Stock Yards of Chicago for market.

Of the eighty cattle slaughtered on November 29, forty-three were pronounced practically cured and fit for food by the inspectors of the Bureau of Animal Industry, and twenty-five were pronounced to be completely cured and fit for food by the State veterinarian. Considering that this number included forty of the very worst cases taken for experiment, the result can not but be considered as extremely satisfactory. If the conclusions of the Bureau inspectors are taken, the result is a cure of 53 per cent of the affected animals; while should we accept the extraordinarily biased report of the State veterinarian, we still find that over 31 per cent of the animals were completely cured.

The following report given to the press by the State board explains itself:

NO CURES OF LUMPY-JAW EFFECTED.

REPORT OF STATE VETERINARIANS ON EXPERIMENTS MADE IN CHICAGO.

SPRINGFIELD, ILL., December 7 (*special*).

The State board of live-stock commissioners to-day gave out for publication the following:

CHICAGO, ILL., December 5, 1892.

To the State Board of Live-Stock Commissioners, Springfield, Ill.:

GENTLEMEN: Tuesday, the 29th of November, at the request of Mr. McChesney, of your board, we, the undersigned, assisted in making post-mortem examinations of 80 head of cattle that were slaughtered in Hess Brothers' slaughterhouse in this

city. We beg to report on the same as follows: Fifty-five of these cattle were found to be affected with actinomycosis (lumpy-jaw) and 25 were healthy.

Respectfully submitted.

JOHN CASEWELL, M. R. C. V. S.,
State Veterinarian.

JOSEPH HUGHES, M. R. C. V. S.

A. H. BAKER, D. V. S.,
Assistant State Veterinarian.

Forty of the cattle found diseased were, after fully two months' treatment, pronounced by the Bureau officials incurable; the other 40 were composed of the class of cases that the State veterinarian does not pronounce diseased on ante-mortem inspection, but holds for post-mortem inspection before deciding them affected with actinomycosis. After being treated for over two months, 15 of these 40 questionable cases were found, upon post-mortem examination, to be affected with actinomycosis. For months the percentage of this class of cattle pronounced free from disease, upon post-mortem examination each week by the State veterinarian, exceeds that of these 40 experiment cattle, so that so far as the experiment cattle already killed are concerned there is no evidence that the treatment used has effected any cures.

The statement that 40 of the cattle belonged to the "class of cases that the State veterinarian does not pronounce diseased on ante-mortem inspection, but holds for post-mortem inspection before deciding them affected with actinomycosis" is misleading, as there was not an animal among them that was not plainly affected with that disease when it was taken for treatment.

The other statement that "for months the percentage of this class of cattle pronounced free from disease upon post-mortem examination each week by the State veterinarian exceeds that of the 40 experiment cattle" is absolutely incorrect, unless it refers to the months during which the affected animals were being collected for this experiment. During these months it is freely admitted that the State veterinarian passed a large proportion of such cases as fit for food, even when they were badly diseased. This fact, admitted in the above press dispatch given out by the board, shows the insincerity and lack of principle governing their inspection. When they inspected the carcasses belonging to the Government they condemned every carcass which showed a tumor the size of a grain of wheat or an abscess the size of a hazelnut. When they inspected in the yards they passed cattle as sound which had tumors and abscesses larger than a man's clenched hand. In the latter case they were trying to prevent the Department from obtaining cattle for experiment, while in the former case they were trying to disparage the results of the treatment. Admitting, then, this statement of the board that "for months the percentage of this class of cattle pronounced free from disease upon post-mortem examination each week by the State veterinarian exceeds that of these 40 experiment cattle," it can be shown from their own reports that this has not always been the case. Of the 40 experiment cattle referred to, 25 were pronounced free from the disease by the State veterinarian; that is to say, 62.5 per cent.

Referring to the reports of the board of live stock commissioners for the State of Illinois for the years ending October 31, 1889, 1890, and 1891, we find the figures given for the number isolated and the number condemned as follows:

	Number isolated.	Number released.	Number affected and slaughtered.
1889.			
Union Stock Yards.....	840	58	782
National Stock Yards.....	123	3	120
1890.			
Union Stock Yards.....	1,563	144	1,419
National Stock Yards.....	100	5	95
1891.			
Union Stock Yards.....	2,259	133	2,126
National Stock Yards.....	131	6	125
Total.....	5,016	349	4,667

This table shows that for three years there was less than 7 per cent of the isolated animals which were pronounced free from the disease. To explain even this number, considered by the board to be large, the following statement is made in their report:

The large number of animals released, as shown by the first table, is largely composed of those that were returned to the yards by the purchasers after they had reached the slaughterhouses, because they had a small lump, due to injuries, or other causes than actinomycosis, fearing that this would be made an excuse by the city health inspectors in the slaughter-house to cut down the carcasses, in which case the purchaser would have to bear the loss. All such cases turned back were inspected by our veterinarian, and we are advised that not a single one of these cases proved to be actinomycosis. (Annual Report of the Board of Live Stock Commissioners for the State of Illinois, 1890, p. 52.)

If during the years 1889, 1890, and 1891 the State veterinarian was so expert in determining actinomycosis in the living animal that less than 7 per cent of those isolated were found free from disease, and even these were mostly animals with small lumps due to injuries, turned back by purchasers and not by the veterinarian, how can we explain the sudden loss of this expertness in 1892 and the isolation of over 60 per cent of cattle which are afterwards pronounced free from the disease? This question is a pressing one at this time, for the statements of the board are inexplicable and inconsistent, and it is plain either that these statements are incorrect or that there has been an extraordinary change in the principles governing the inspection.

The animals taken for the experiment of the Department did not include any turned back by the purchasers on account of injuries, but every one was pronounced by the veterinary inspectors to be affected with actinomycosis. How, under such circumstances, the board can state that they have for months pronounced over 62 per cent of such cases to be free from the disease is a mystery and shows conclusively that

their action either in 1889, 1890, and 1891, or in 1892 was unskillful and lacking in uniformity or that they purposely modified their principles of inspection in order to disparage the results of this experiment. Whatever may be the final conclusion as to the cause of their action, the open hostility of the board has been apparent from the time the first animals were selected, and it has continued with increasing intensity as the success of the treatment became more and more apparent.

As the officiousness of the State inspectors made a proper inspection by the Bureau inspectors a difficult matter, and as the former assumed jurisdiction as meat inspectors which is not given them by law, and as finally they had shown a determination to cause the destruction of carcasses of cattle belonging to the Government, which carcasses were not diseased, I decided not to invite them to be present when the next lot of cattle was slaughtered.

On December 2 a lot of twenty head, all of which had been cured, were slaughtered at the same place, in presence of the Bureau inspectors above named and also of the inspector of the city department of health. Every one of these animals was free from disease, as was shown by the most careful post-mortem examination.

The examination of the one hundred head of cattle first slaughtered shows, according to the reports of the Bureau inspectors, who were unbiased and had no interest in the experiment beyond a desire to get accurate results, that sixty-three of these animals had been cured by the treatment. This is a cure of nearly two-thirds of the animals treated, and certainly can not be surpassed by the results of treatment with any of the internal diseases of a progressive nature which affect animal life. This is the more gratifying as some of the animals which were pronounced healthy by the State veterinarian had been affected with enormous tumors, which entirely disappeared during the course of the treatment.

The following correspondence in regard to the slaughter of twenty animals without notifying the State board explains itself:

STATE OF ILLINOIS, EXECUTIVE OFFICE,
Springfield, December 3, 1892.

DEAR SIR: Complaint is made to me by the live-stock commissioners of Illinois that on yesterday the second consignment of cattle delivered to your agent for experiment were slaughtered in Chicago without notice to the live stock commissioners of this State. I am also informed that there was an agreement previously entered into, when these cattle were taken for experiment purposes, that the live stock commissioners would be notified when said cattle were slaughtered, and afforded an opportunity to make a post-mortem inspection.

Permit me to call your attention to this complaint, believing that you will direct your agents in Chicago to carry out the agreement above named, and that, before slaughtering the remaining cattle under experiment, the commissioners will be duly notified and given an opportunity to make an inspection.

Yours, very truly,

JOSEPH W. FIFER,

Hon. J. M. RUSK,

Secretary of Agriculture, Washington, D. C.

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., December 6, 1892.

DEAR SIR: I am in receipt of your favor of the 3d instant, in which you state that complaint is made to you by the live-stock commissioners of Illinois that on December 2 the second consignment of cattle from the animals under experiment by this Department was slaughtered in Chicago without notice to such commissioners.

In reply I would say that this is correct and that, in order to give you a full statement of the reasons for such action, I inclose with this, for your information, a copy of the report made to me by Dr. D. E. Salmon, chief of the Bureau of Animal Industry, under whose direction the slaughter was made.

It appears from this report that the State veterinarian attempted to take charge of the inspection of the animals, that the inspection made by the inspectors of this Department was ignored, and that a certificate was given to the inspectors of the city department of health that eighteen carcasses were unfit for food which had been passed by the United States inspectors.

The invitation was extended to you by my direction, according to agreement, as an act of courtesy, to enable your representatives to witness the results of the experiment as revealed by the post-mortem examination, and every facility was given them for this purpose. Being there by invitation, their attempt to assume control and to enforce their unjust decision as to the disposition of the meat was an interference with the jurisdiction of this Department which could not be tolerated.

The Department inspectors were acting under the acts of Congress authorizing the inspection of meats, as well as the investigation and prevention of disease, and the test which they were conducting was to discover a cure in the interest of the cattle-raisers of the whole country. I am, therefore surprised to learn that the live-stock commissioners of Illinois and their assistants have gone, not only to the full extent of their authority, but beyond such authority, to obstruct and delay this experiment and to disparage its results.

I regret that the action of the commissioners, or those acting for them on the day mentioned, was such as to lead Dr. Salmon to the conclusion that he could not conscientiously invite them to be present at the slaughter on Friday, the 2d instant.

I think you will agree with me that if his statement of facts is correct, and I have no doubt it is as he understood them, that he could not properly have done otherwise.

The stand which is taken by the live-stock commissioners of Illinois in regard to the condemnation of these carcasses is a matter of great consequence to the stock owners of the United States, and it also involves property belonging to the United States Government. The inspection of animals for food should be uniform and just, and the meat inspection of this Department, which is authorized by act of Congress, and which is carried on by competent men, should be recognized. As the responsible officer in charge, I can not permit it to be ignored or called in question by State officials who are not even given jurisdiction as meat inspectors by the laws of the State.

Very respectfully,

J. M. Rusk,
Secretary.

Hon. JOSEPH W. FIFER,
Governor of Illinois, Executive Mansion, Springfield, Ill.

Soon after this the chairman of the Illinois board of live-stock commissioners addressed a communication to the Secretary of Agriculture,

which was of so scurrilous and discourteous a character that it was returned to Gov. Fifer with the following letter:

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., December 19, 1892.

SIR: I inclose herewith a communication addressed to me by the chairman of the Illinois State board of live-stock commissioners, which not only refers to a number of matters with which he has nothing to do officially, but which is so discourteous in its tone that I must decline to receive it. If the board mentioned has anything to bring to the attention of this Department which you deem proper to transmit, I shall be glad to give it careful consideration, but I can not have any direct communication with a man in that position whose ideas of official courtesy are exemplified by such a letter as the one I return.

The letter in question is incontestable evidence of Mr. McChesney's unfitness for the office which he holds.

Very respectfully,

J. M. RUSK,
Secretary.

Hon. JOSEPH W. FIFER,
Governor of Illinois, Executive Mansion, Springfield, Ill.

To this the governor replied as follows:

STATE OF ILLINOIS, EXECUTIVE OFFICE,
Springfield, January 3, 1893.

MY DEAR SIR: I am in receipt of your favor of December 19, and contents noted. When I received your letter of December 6 I immediately called upon the board of live-stock commissioners of this State for a full and complete statement concerning their action in the matter of diseased cattle turned over to your Department for experimenting in the city of Chicago, and I inclose you a copy of their report to me on that subject, dated December 16.

I regret exceedingly the conflict that has arisen. I had no knowledge whatever, directly or indirectly, that Mr. McChesney would write you as he did under date of December 16, and I regret exceedingly that he did so. My administration closes now in a few days. The general assembly of this State convened to-day. I am very busy with official business that must be closed out before I give up the office to my successor. Were it not that my term of office expires in a few days I would give this controversy between the live-stock commissioners and your representatives further consideration.

Assuring you of my high regard and esteem, I remain, yours very respectfully,
JOSEPH W. FIFER.

Hon. J. M. RUSK,
Secretary of Agriculture, Washington, D. C.

The Secretary of Agriculture replied to the above letter and asked for the removal of the quarantine which the board had again imposed upon the cattle. His letter is given below:

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., January 7, 1893.

MY DEAR SIR: I am in receipt of your very satisfactory letter of the 3d instant, for which I wish to express my thanks. The report of the board of live-stock commissioners, which you state was inclosed, has not reached me, and for that reason I do not know what position they have taken in regard to the cattle belonging to this Department.

The chairman of the board, after writing his very discourteous letter to me, had the quarantine again put upon the cattle. I feel sure that you were not informed of this, or you would have taken action to cause its revocation. Up to the present it has caused me no embarrassment, because I was not ready to slaughter the cattle, but I wish now to have them slaughtered at once. I would request you, therefore, to have this quarantine removed, so that the cattle can be shipped to Chicago for slaughter the first of next week.

I am sure that you have been desirous of giving every facility for making this experiment, which is of so much interest and value to the farmers of your State and of the whole country, and that you are willing to do everything in your power to prevent delay in completing it, and giving the results to the cattle owners, to whom it is of vital importance.

There was no reason whatever for the board of live-stock commissioners to put a quarantine upon these cattle, because they knew very well that I would ship them to Chicago and have them slaughtered. Cattle affected with actinomycosis are daily allowed to be shipped to the Union Stock Yards for slaughter, and, therefore, in case any of these are still affected, this Department is asking nothing beyond what is allowed without restriction to every cattle owner in the country.

I hope that the board of live-stock commissioners will no longer be allowed to maintain their position for the purpose of obstructing an investigation made as much in the interest of the people of your State as for the people of any other section of the country.

Assuring you of my appreciation of your courtesy in this matter, I am, very respectfully,

J. M. RUSK,
Secretary.

Hon. JOSEPH W. FIFER,
Governor of Illinois, Springfield, Ill.

INJUSTICE TO OWNERS OF LUMPY-JAW CATTLE.

Although the Illinois board of live-stock commissioners began quarantining and condemning cattle affected with actinomycosis in 1888, it was not until their meeting of February 21, 1890, that they discovered that the owners of such cattle were only receiving from \$2.50 to \$4 per head for them. This was less than the value of their hides. Even at that late date the board did not make the discovery itself, but the facts were presented to it by a committee of the Live-Stock Exchange.

It is usually admitted that when the property of citizens is taken and destroyed for the good of the community, the citizen who suffers the loss should receive a just compensation, and the law of Illinois under which the board has acted provides for the appraisement and compensation for cattle destroyed to prevent the spread of disease. Although the cattle affected with actinomycosis were ostensibly condemned to prevent the spread of that disease, it appears that no appraisement or compensation has been made as provided in the law. On the contrary, the destruction of these animals was enforced without any compensation from the State, and with no effort on the part of the board to see that the owners received even a just compensation from the parties who took possession of the carcasses. The owners were powerless. The cattle were seized and destroyed by order of the State board, and

the carcasses were turned over to the Union Rendering Company, which gave for them what it saw fit, and no more. The result was the owners were robbed of two-thirds or three-fourths of the value of their cattle even for rendering purposes.

According to the inspection rules of every country which carries on a meat inspection, and also according to the teachings of the most eminent scientists who have investigated the question, actinomycosis is generally considered a local affection, and in its early stages does not affect the general health of the animal or the wholesomeness of the meat. There is no good reason, consequently, for condemning animals in good condition which present only a small swelling on the jaw caused by the actinomyces fungus, and from which there is no discharge. In this case the part of the animal involved is not used for food, and when that is removed it is the general opinion of scientists that the remainder of the carcass is not affected. To condemn and destroy such carcasses as this is, therefore, unjustifiable from any point of view. It is especially uncalled for as an act to prevent the spread of the disease, as the most extreme believers in the contagion theory can not explain how the disease could be transmitted from an animal which had no discharge from the tumor by which the fungus could be disseminated.

It has not been uncommon to see steers in fine condition, weighing from 1,600 to 1,800 pounds, and worth 5 cents a pound, condemned because of a small swelling on the jaw which was scarcely more than visible. Such a steer would bring on the market for beef \$80 or \$90, but when condemned and delivered to the Union Rendering Company, the owner received, according to the board's own statement, not to exceed \$4. And this wholesale appropriation of the farmer's property was allowed to proceed for nearly two years before the members of the board became officially aware of what an outrage they were assisting to perpetrate.

Since that time a more satisfactory arrangement has been made, through the exertions of the Live-Stock Exchange. Under the new plan the carcasses are turned over to a rendering establishment in the stock yards, and the owner receives 1 cent a pound, less \$3 a head. That is to say, the owner of a steer weighing 1,600 pounds would now receive \$13 for the carcass. Even this is less than its real value for rendering purposes. In disposing of the cattle purchased by the Department for the experiment, no difficulty was found in getting offers of 1 cent a pound without any discount. An offer of this kind was received from the very firm which obtains the other cattle condemned at \$3 per head less. The conclusion is unavoidable, therefore, that the shippers of these cattle do not receive as much by \$3 a head as they are entitled to and as the carcasses are really worth.

If we should admit, which we do not, that the condemnation of the board is in all cases legal and justifiable, there would still remain this great wrong of forcing the owners of these cattle to take \$3 per head

less than they are actually worth when sold with an opportunity for free competition in the purchase. One would suppose that a board assuming the authority and the responsibility of making such seizures, would feel it incumbent upon itself to see that the owners were fairly treated in the disposal of their property, but apparently this is not the case.

THE JURISDICTION OF THE ILLINOIS BOARD OF LIVE-STOCK COMMISSIONERS OVER ANIMALS AFFECTED WITH LUMPY-JAW.

The Illinois board of live-stock commissioners is given no authority or duties by law in the inspection of meat. It was created to suppress and prevent the spread of contagious diseases among animals in the State of Illinois. Its powers to quarantine and cause the slaughter of animals is expressly limited by the statute under which it acts to animals affected with "dangerously contagious or dangerously infectious disease." Lumpy-jaw is, in the opinion of the State veterinarian, a dangerously contagious disease, and consequently the board assumes that it is fully empowered to quarantine and cause the destruction of animals so affected.

As many of the carcasses destroyed were plainly unfit for human food, being emaciated and in some cases affected with a more or less generalized form of the disease, there were many who were inclined to sustain the action of the board on this account, even if it should be shown that the disease was not "dangerously contagious" and consequently not within the intent of the law. However, the board did not confine itself to such carcasses, but seized animals in good condition, with only small lumps which were not discharging, and in general their actions were so arbitrary, dictatorial, and burdensome, that the cattle-owners of a large section of the country tributary to Chicago have been loud in their protests and vigorous in their demands for relief.

This situation raises the question as to whether the board has, under the Illinois law, any jurisdiction over animals affected with this disease—in other words, whether actinomycosis is a dangerously contagious disease, as stated in the opinion of the State veterinarian. To sustain itself the board has collected a number of reports of experiments in which it is alleged that the disease was communicated by inoculation with the tissue and discharge from the diseased parts of affected animals.

The reasoning appears to be that if a disease is inoculable it must be contagious, and if it tends to progress until the life of the animal is destroyed it must be dangerously contagious (Report, 1890, p. 20). This reasoning may be satisfactory to the board, but it will hardly be considered so by any unbiased scientist.

In the first place, a disease is not necessarily contagious because it is inoculable. Pyæmia, septicæmia, malignant œdema, black quarter, and tetanus (lockjaw) are all inoculable diseases, much more so than is

actinomycosis, and yet it is well known that these diseases do not spread by contagion from animal to animal, and they can not properly be regarded as contagious diseases. All of these diseases, with one exception, affect mankind, but it would be absurd to claim that people are infected from diseased animals because of the coincidence that man and animals both suffer from the germs of these diseases. It is well known that these germs exist nearly everywhere and that animals and men get them from the same source in nature. The actinomyces fungus is also widely distributed, and grows upon the straw and beards of grain, and probably upon grasses, and for that reason it must be almost universally present. Leading scientists have, therefore, concluded that, with this disease, as with lockjaw, the germs of the disease are obtained by man from the same sources as by animals—that is, from the sources in nature where they abound.

The next question which suggests itself is, what is meant by “a dangerously contagious or dangerously infectious disease?” The word “dangerously” is evidently an adverb qualifying the words “contagious” and “infectious,” and, as all words in a statute are supposed to have been put there for a definite purpose, we can only conclude that not all contagious and infectious diseases are meant, but only the dangerously contagious and dangerously infectious diseases, as stated. The meaning of “dangerously contagious” or “dangerously infectious” in this connection can only be taken as highly contagious or highly infectious, or at least having such a degree of contagiousness or infectiousness as to make the affected animals dangerous to the stock interests of the State.

The board says, however, that “no one will claim that actinomycosis is a highly contagious disease” (Rep. 1890, p. 20). They go on to say that “when the actinomyces have invaded the vital organs of the body, the disease, in both man and animals, is pronounced, by physicians and veterinarians, as fatal as tuberculosis, hence it must be listed in the catalogue of dangerously contagious diseases.”

This reasoning would make the word “dangerously,” which is an adverb, qualify the word “disease,” which is a noun. That is, it is assumed because this disease is dangerous and fatal, when not properly treated, that it is a “dangerously contagious disease.” But adverbs do not qualify nouns, and hence the word “dangerously” can only refer to the degree of contagiousness or infectiousness, and not to the fatal character of the malady. A disease may be extremely fatal, but not in the least degree contagious, and it may be very fatal and only contagious when purposely inoculated, as in the case of tetanus, or lockjaw, but it would be perverting the use of language to speak of either of these classes of disease as “dangerously contagious.”

It has been quite generally held by scientists who have investigated actinomycosis that it should be classed with those diseases which, like tetanus, or lockjaw, are produced by vegetable parasites inoculated by

hard bodies of various kinds which are infected, and which accidentally wound the skin, the mucous membrane, or other tissues, and thus gain entrance to the body.

There have been a number of cases recorded in which actinomycosis has been experimentally transmitted by inoculation from diseased to healthy animals. A large proportion of the successful inoculations were made with rabbits and guinea-pigs—animals which are very susceptible to most kinds of infection. In some cases large animals have been used, and with these the disease has been sometimes transmitted, and in other cases no result has followed the inoculation. The methods employed have been to deposit infectious matter in the abdominal cavity or in the connective tissue, or to inject it directly into the blood vessels. The results in most of the cases are of theoretical rather than practical value, because it is not likely that animals would be accidentally inoculated into the abdominal cavity or into the blood vessels. It is also an admitted fact with other diseases that those which require wounds of the skin and mucous membrane for the parasites to gain entrance to the tissues only in exceptional instances spread from animal to animal under natural conditions. So with actinomycosis, it is theoretically possible, but not probable, that an accidental inoculation might occur by which the disease would be transmitted from a diseased to a healthy animal. This contingency is too remote, however, according to our present knowledge, to give any warrant for considering the disease as dangerously contagious.

The Illinois board of live-stock commissioners admits that before suppuration sets in, and there is a discharge, the disease is probably not transmissible, naturally, from one animal to another. (Rep. 1890, p. 20.) This conclusion is incontestable, but in spite of it many animals, which did not have a discharge, have been seized by order of the board, taken from the owners and condemned to the rendering tanks. How the board can justify such action under a law which only permits it to quarantine and slaughter animals affected with a "dangerously contagious" or "dangerously infectious" disease, it is difficult to understand.

If this board actually believes that actinomycosis is a dangerously-contagious disease, its action has not been consistent with that opinion. Affected animals have been allowed to come freely into the Union Stock Yards to the number of 100 or 200 a month. They go into all of the pens, mix with thousands of cattle, and the action of the board, instead of hastening their slaughter, actually delays it and gives additional opportunity for contagion.

The diseased animals, instead of being slaughtered as soon as discovered, are placed in open pens, surrounded on all sides by healthy cattle, and are held in that condition until the end of the week, when the State veterinarian comes and decides as to whether they shall be condemned or not. There is no effort to clean and disinfect the pens

where the diseased animals have been, and I have, myself, seen the State veterinarian open abscesses of affected animals and allow them to drip pus by the pint into the public alleyways of the yards, where thousands of cattle were driven, without any thought of having this infectious material cleaned up or disinfected.

Instead of lessening the chances of infection in the Union stock-yards, the action of the State board actually increases it. Indeed, it is difficult to see how any one believing in the contagiousness of the disease would cause the affected animals to be held in the interior of such great stock yards from the beginning to the end of the week before they are disposed of, and equally difficult to understand how constant and thorough disinfection could be dispensed with. It is impossible to find any measures adopted by the board which are calculated to prevent the spread of the disease should it be contagious, but on the contrary, the measures enforced, as already stated, are of such a nature as to assist the dissemination of contagion.

The board has devoted considerable space in its reports to arguments by which it attempts to show the danger to consumers of the meat of animals affected with actinomycosis. Their extravagant statements have excited the wonder and ridicule of sanitarians the world over. It would appear from the attention which the board has given to this aspect of the question, from the condemnations by it of some carcasses of affected animals and the passing of others as fit for food, from the neglect to disinfect cars, yards, and alleys where diseased cattle have been, and from the holding of diseased cattle in the stock yards a whole week for the visit of the State veterinarian, that its action in regard to lumpy jaw is a meat inspection measure and not a measure for the purpose of preventing the spread of a contagious disease among animals.

The board, however, has no authority to inspect meat, but was created for the purpose of "the suppression and prevention of the spread of contagious and infectious diseases among domestic animals." When it goes beyond this purpose, it would appear to be acting outside of the law, and it certainly causes great and unnecessary hardship to cattle owners in holding their animals a whole week for inspection. If there is to be a State meat inspection applied to cattle in the interstate trade, that inspection should be promptly made by competent inspectors, and there should be an end to this ridiculous method by which suspicious cattle are collected for a whole week by employes ignorant of the nature of cattle diseases, and then passed upon by the State veterinarian by a cursory examination on Saturday. An inspection of value to the consumers or satisfactory to the producers can not be conducted in yards where from 50,000 to 75,000 head of cattle arrive weekly, by a single veterinarian, who devotes but one day in the week to this duty.

The important question in this connection is as to whether the board

has jurisdiction for the inspection of meat. If it has not, then its acts in condemning animals and meats for the purpose of preventing certain carcasses from going on the market for food can only be considered as illegal. In that case there would be no need of considering whether or not actinomycosis might be communicated to the consumers of the flesh of affected animals, as the question at issue would turn on the jurisdiction of the board, and the cattle owners would thus secure relief.

The danger of the transmission of this disease to people from affected animals has been insisted upon by the board in such unequivocal terms, however, that a public interest has been aroused which makes it desirable to quote the opinions of some of those unbiased scientists who have given most attention to the subject. Actinomycosis in people is a very rare disease, and but few cases are on record as having occurred in this country. If there were any great danger of its being communicated by the flesh of affected animals we should certainly expect that it would be more frequent. On the other hand tuberculosis is one of the most common diseases of mankind, and is known to be communicable among animals by taking tuberculous germs with the food, and yet, as appears from Dr. Norgaard's report attached hereto, the inspectors of the State board and of the city health department pay no attention to meat that is covered with tubercles even when it is exposed to their view in the slaughterhouses. Tuberculous meat is incomparably more dangerous than that of animals affected with actinomycosis, and, hence, it is difficult to understand this inconsistency in the action of inspectors who claim to be so solicitous for the public health.

Prof. Crookshank, in the course of an exhaustive review of our knowledge of actinomycosis, published in the annual report of the agricultural department, privy council office, on the contagious diseases, inspection, and transit of animals for the year 1888, says, by way of conclusion:

The successful transmission of actinomycosis from man to bovines suggests intercommunicability, but the negative evidence as to infection of man from bovines supports the view that the disease is derived from some source which is common to both species. (S. C., p. 115.)

In summing up the evidence as to the source of the disease in man, he says:

Many interesting observations have been made upon the origin of this disease in man. Two cases have been recorded in support of the theory of direct infection from the cow. Stelzner described a case of the actinomycosis in a man who had had the care of animals some of which had suppurating glands. Hacker had a case of the tongue in a man who had charge of cows, one of which had a tumor of the jaw, which he had opened. On the other hand, Moosbrugger found that out of 75 cases 54 were in men and 21 in women, including 2 children. In 11 of these the occupation was not stated. In 33 their occupation did not bring them into contact with diseased animals. They were, for example, millers, glaziers, tailors, shop people, and students. Only 10 cases occurred among farmers, peasants, and farm laborers. In 1 case only out of the 10 had the patient been in contact with diseased animals.

Out of the 21 women there were only 4 peasants, and none of them had been associated with diseased cattle.

Infection by the flesh of diseased animals has also been discussed, but there is no evidence of the prevalence of the disease among slaughterers and butchers, who would be particularly liable to it if flesh were a source of infection. The chances of infection by ingestion are minimized by the flesh being almost always cooked. Actinomycosis occurs also in pigs, and pork is often eaten in an uncooked state, but Israël has pointed out that this may probably be excluded, as many of the cases occurred among strict Jews.

The evidence points to the disease originating in man and lower animals from the same source, and there is a very strong suspicion attached to cereals. This view is supported by important observations with reference to the part played by cereals in inducing the disease in cattle, which have already been mentioned, and it gains additional support from a case described by Soltmann, where the disease resulted from swallowing an awn of barley. A boy, aged 11, accidentally swallowed an awn of *Hordeum murinum*. He became very ill and suffered great pain behind the sternum, extending over six intercostal spaces, and when opened the awn of barley was found in the evacuated pus. The pain, however, continued and fresh deposits occurred, and when the boy was taken to the hospital the ray-fungus was detected. Possibly the spores of the fungus can be conveyed both by air and water.

Friedberger and Fröhner, in the last edition of their excellent Treatise on the Special Pathology and Therapeutics of the Domesticated Animals, published in 1892, give the following unbiased opinions, which they form from the scientific investigations made up to the present time:

Experiments to transfer the same to other animals have been made by several parties, but were always unsuccessful (Rivolta, Bollinger, Seidamgrotzky, Perroncito, Johné, Ullmann, Bodemer, Boström). Cattle, calves, goats, sheep, wethers, hogs, dogs, cats, rabbits, guinea-pigs, did not suffer after inoculation; only in some cases a granulation, outlined by inflammation, developed as the reaction of the organism against the inoculated foreign bodies. The alleged positive results of inoculation of Ponfik, Israël, Rotter, and Hanan refer, according to Boström, only to inoculation material which remained and was encysted (encapsuled). It appears that the actinomyces fungus produces a pathogenic effect only in that stage of development reached in connection with the beards of grain; but when once introduced into the animal body it is no longer transferable, because it immediately assumes involution forms (calcification) after inoculation. The negative results of the inoculation experiments are of great importance for the solution of the question whether or not a transmission of actinomycosis occurs from animal to animal or from animal to man. All are of the opinion that an infection of this kind does not take place (p. 585).

Inspection of meat.—As already mentioned in the article on "Pathogenesis," it must be considered as very improbable that the actinomycosis is a contagious or an infectious disease in the sense of its transmission from animal to animal or from animal to man. A case of infection of man from cattle affected with actinomycosis has never been observed which was free from all objections. At the most, such a transmission may be considered perhaps as possible from a theoretical standpoint, but not as probable. Experience is positive against the occurrence of a direct transmission. The actinomycosis, therefore, in relation to the inspection of meat is by no means so important as tuberculosis, even setting aside the fact that the former usually represents only a local affection. The meat of cattle affected with actinomycosis may be commercially disposed of without hesitation after the affected parts have been removed; it is objected to only in the rare cases of a generalized actinomycosis (p. 592).

Ostertag, in his handbook of meat inspection, published in 1892, says, after reviewing the evidence at hand:

According to this, we are hardly justified in assuming that the use of actinomycotic organs as food is injurious to health. At any rate, we must deny the possibility of this for the meat of actinomycotic animals. The activity of the sanitary police should therefore be restricted to the detection of all organs affected with actinomycosis, and the withdrawal of them from the market as highly spoiled food products in proportion as the specifically changed portions can not be certainly removed. In isolated lesions in the tongue this will usually be possible, and is further recommended, as the tongue is a valuable organ. In cases of generalization the whole animal is to be withdrawn from the market, because the generalization in actinomycosis seems to have an entirely atypical cause, and the detection of the total lesions (in the bone, in the depth of the muscles) is much less easy than in tuberculosis, in which the regular lymph gland affection answers as an excellent guide for the discovery of the diseased areas.

Prof. Thomas Walley, in the second edition of his very thorough Practical Guide to Meat Inspection, published in 1891, says (pp. 135-387):

The malady affects man, and is in him known as *actinomycosis hominis*, and while it has been transmitted by inoculation from man to the calf (Crookshank), so far as I am aware there is no direct evidence of the transmission of the disease from animals to man. Nor indeed is such a contingency ever likely to arise, seeing that the vitality of the spores of the hyphomycetes is much inferior to those of the pathogenic fungi, and that the changes produced by it in the organs attacked are so marked as to attract the immediate attention of even ordinary persons; and what is of more importance, the lesions of the disease are seldom localized, except in the pig, in the muscular tissue of the body. * * * Although certain organs, such as the tongue, may be largely involved, there is not much accompanying fever or interference with the normal functions or with the nutrition of the blood, and any systemic changes that arise are due mainly to annihilation of the functions of the tongue, or of the particular organ involved, and as a result of this a state of poverty is induced. Seeing that the disease is rarely of a systemic nature, and that there is an absence of fever, the nutritive changes induced in the muscles are so slight as to do away, in the great majority of cases, with the question of nocuity of the flesh; but, notwithstanding this, if there is any evidence of malnutrition of the blood or of the flesh, the carcass should be condemned for human food and in every instance the affected organ or organs should be effectually destroyed.

EXPERIMENT TO TEST THE CONTAGIOUSNESS OF ACTINOMYCOSIS.

When the cattle affected with actinomycosis were placed under treatment 21 healthy cattle were placed among them in the stables in such a way that they would be most exposed to the infection of the disease. The healthy animals were tied between diseased ones, where they were obliged to eat food soiled with the discharges from the tumors, and where they could not but inhale the breath warm from the lungs. There would appear to be no way possible of making a more severe test, and yet after being in such proximity with diseased animals for four months not a single one showed signs of being affected either while alive or on post-mortem examination after they were slaughtered.

DOES THE IODIDE TREATMENT DRIVE THE DISEASE TO THE INTERNAL ORGANS?

In a weekly agricultural journal printed in Chicago appeared a statement, under date of December 7, 1892, of the results of the post mortem examinations made of the eighty cattle slaughtered on November 29. This statement was evidently inspired by the State veterinarian or one of his assistants, as the post mortem notes of each case as taken by these officials were given in full. In this statement occurs the following language:

From the experiment just concluded we learn conclusively that iodide of potash has an effect upon cattle afflicted with actinomycosis, and possibly that it may cure simple cases characterized by glandular swellings or abscesses not attached to the bone. The general effect, however, is more of a dangerous than beneficial character as regards severe cases of lumpy jaw, where suppurating tumors implicating the bones are noticeable about the head. Used in such cases iodide of potash apparently causes a superficial drying up of the suppurating sores which might lead the owner to believe that a cure had been accomplished, when, on the contrary, such external effects are no safe criterion of internal conditions. The post-mortem examination of animals so healed externally developed serious trouble within, trouble that had evidently been carried by the blood and possibly driven inwards by the drug employed.

The question now is, was there anything in the results of the examination to justify the conclusion that there were more internal lesions than are usually found in animals affected with actinomycosis? So far from this being the case, there was a very much smaller proportion of the animals affected internally than was to be expected. The State veterinarian and his assistants are certainly the last people who would be expected to give the impression that a larger proportion of these animals were affected internally than is usually found.

The following table is compiled from the reports of the Illinois board of live-stock commissioners for 1890. It shows the proportion of untreated animals which were found affected in the lungs or abdominal organs:

Date of examination.	Number of animals examined.	Number affected internally.	Page of report where recorded.	By whom examined.
Mar. 11, 12, 1889	5	5	17	Dr. Baker.
Dec. 6, 1889	3	3	27	Drs. Casewell, Scott, Williams, and Page.
Aug. 11, 1890	55	43	19	Drs. Baker and Hughes.
Aug. 14, 1890	34	23	19	Do.
Total	97	74		

Fully 76 per cent of these animals were, therefore, affected in the lungs or abdominal organs. Now, taking the notes of the State veterinarian as published in the paper above mentioned, we find that they admit fifty-five of the animals had actinomycosis at the time of slaughter, while they found lesions of the lungs and abdominal organs in only twenty-three; that is, turning all the facts so that they will bear as

much as possible towards this view that the iodide treatment tends to develop the disease internally, we find that, of the fifty-five affected animals which had been treated, but 42 per cent were affected internally, as against 76 per cent found with untreated animals by the State veterinarian and his assistants.

This, however, is not a fair statement of the case, because eighty animals, every one of which had the disease before treatment, were examined, and of these only 28 $\frac{3}{4}$ per cent were found affected internally at the time of slaughter. And this is taking the statements of men who were doing everything in their power to disparage the results of the experiment and make it appear valueless.

As a matter of fact, the statement referred to which was printed from the notes of the State veterinarian does not correspond with the records of the bureau inspectors. Dr. Norgaard dictated a record of the condition of each animal as examined to a stenographer as the examination was made, and this record is the only accurate one that exists. From this official record it appears that seventeen of the animals reported by the State veterinarian to have internal lesions of actinomycosis did not have such lesions. Some of them had small nodules along the intestinal walls, which are common in healthy cattle, but when these were examined microscopically they were shown not to be affected with the actinomyces. There are several other cases reported with internal lesions, the numbers of which do not correspond with the numbers of any of the cattle slaughtered. There was evidently an error in printing the numbers of these animals, and I am unable for that reason to compare the notes with those made by Dr. Norgaard. Taking the examination made by Dr. Norgaard, therefore, as a basis for calculation, we find that among the eighty cattle killed on November 29 there were but four which showed internal lesions caused by the actinomyces fungus. As twenty additional animals were killed and examined on December 2, in none of which any trace of internal lesions was found, the result was that in the 100 animals first slaughtered but 4 per cent showed evidence of the disease having affected the internal organs located in the thorax and abdomen.

The proportion of animals affected internally was very much less than was expected, and it is conclusively demonstrated by this fact that the iodide of potassium reduces the proportion of internal lesions and that it has fully as wonderful an effect on these as it has on the external lesions. This is precisely what we should expect from internal and constitutional treatment. If the remedy had been applied externally and caused the tumors to heal from the surface, there might have been some reason for anticipating a change of the seat of disease from external to internal organs. Being, on the contrary, administered internally, the remedy penetrated the whole organism, acting upon the internal organs at the same time as upon the external tumor, and the effect was not only to prevent the extension of the disease, but to cure any manifestations of it which may have existed in the interior of the body.

It can not be stated too emphatically nor repeated too often that the State veterinarian and his assistants carried out their examination with the determination to disparage the results of the experiment. Every inch of the intestines and every portion of the internal viscera were scrutinized in the most deliberate and anxious manner. The least abnormal sign, though it affected tissue of no greater magnitude than the head of a pin, was set down as a serious internal lesion caused by the actinomyces. Inspection of Dr. Norgaard's notes will show that in a number of cases these lesions were examined microscopically and were proved to be free from the actinomyces germs. Anyone who examines the intestines of healthy cattle will find in their walls, in a considerable proportion of cases, such small tumors, which have not the slightest effect upon the health, and which in many cases are caused by animal parasites. To set these down as internal lesions of lumpy jaw is to show either deplorable ignorance of the subject or deliberate falsification of the facts.

On January 23, 1893, the Secretary of Agriculture informed Governor Altgeld that the cattle remaining in the experiment were ready for slaughter, and requested the removal of the quarantine for that purpose. The governor immediately replied by telegraph that he had directed the board of live stock commissioners to permit the removal of the animals.

The eighty-five animals which had been under treatment were slaughtered on January 27 and 28 at Hess Brothers' slaughterhouse. There were present, besides the Chief of the Bureau of Animal Industry, the following members of the Bureau force: Dr. A. D. Melvin, chief meat inspector at Chicago; Dr. W. S. Devoe, chief inspector for New Jersey; Drs. V. A. Norgaard and L. R. Baker, meat inspectors at Chicago; Dr. M. R. Trumbower, State veterinarian of Illinois, and the inspectors of the Chicago department of health.

The number found on post-mortem examination to be cured was sixty-eight, or 80 per cent of the whole number. Of the seventeen condemned as not cured there were internal lesions of actinomycosis in the lungs of three. About 4½ per cent of this lot of animals, therefore, showed internal lesions.

Of the whole number under treatment, which were killed and examined, viz, 185, there were found to be cured 131, or about 71 per cent. The number showing internal lesions was 7, or 3.8 per cent of the animals in the experiment.

This result is extremely gratifying, and proves that a large proportion of the advanced cases of actinomycosis are curable by the internal administration of iodide of potassium. If taken in the early stages of the disease, there is no doubt that 85 or 90 per cent would yield to this treatment.

THE COST OF TREATMENT.

It has been repeatedly stated by those who have opposed the Department in its effort to relieve the cattle owners from the injustice which has been practiced upon them at Chicago, by giving them a specific treatment for this disease, that farmers can not afford to use a medicine for this purpose which costs \$3 a pound. Let us examine this statement in the light of the facts.

The result of the experiment shows that about two-thirds of the lumpy-jaw steers which come to the stock yards can be cured. If they were taken in an earlier stage of the disease the proportion would be much larger. Taking, however, two-thirds as a basis of calculation, we will see what would be the result on twelve animals averaging 1,200 pounds in weight. If shipped without treatment and condemned they would bring \$9 per head, or \$108 in all. If treated with the same success as the animals in the Department's experiment, there would be eight cured ones, which would bring not less than 4 cents per pound in good flesh, or \$48 per head. This would amount to \$384 for eight head, to which should be added \$36 for the four not cured, making a total of \$420 receipts as against \$108 if not treated. The medicine does not cost over 7 cents for each day it is administered, and no animal should receive over one pound in all. Taking the largest figures and the medicine for treating twelve steers would cost \$36. Deducting this from \$420, we have remaining \$384, a gain of \$276 in all, or \$23 per head over what would have been received if the cattle were not treated. It must be plain to every experienced cattle-feeder that there is no other known medicine, nor indeed any kind of food, which can be given to his animals with a prospect of such returns for the money invested.

It is difficult to understand the motive which will lead men to make such absurd objections and such incorrect statements in regard to a discovery which must prove of such incalculable advantage to the farmer without in the least injuring any other class of our citizens. It appears, however, that certain parties have committed themselves so irrevocably to the position that actinomycosis is a dangerously contagious and incurable disease that they are willing to go to almost any length to prevent the overthrow of this theory. The action of the Illinois live stock commissioners, for instance, made it difficult to obtain cattle for experiment. They quarantined the cattle in the stock yards so that until the governor interfered they could not be taken to the stable for treatment. After the cattle were taken to the stables they were again put in quarantine until the governor ordered them released for a second time. Incorrect reports were sent out apparently on authority of the board, giving the impression that the results were less favorable than was actually the case. Other statements were made as to the proportion of isolated cattle condemned by the board, and as to the proportion affected internally, which are at variance with the rec-

ords given in the printed reports; and after the quarantine was removed from the cattle under experiment it was again imposed on December 31, when the results of the first killing became known. If these several actions were not taken in the first place with a view to preventing the experiment being made, and afterwards to disparage the results obtained, and to delay the completion of the test, it is impossible for me to explain them on any other hypothesis.

SUCCESES OBTAINED BY INDIVIDUALS WITH THE IODIDE TREATMENT.

A considerable number of cattle-feeders have tested the treatment of actinomycosis with iodide of potassium, and their results, so far as reported, have been remarkably successful. Below are given some of the letters received:

BRADFORD, STARK COUNTY, ILL., *November 21, 1892.*

U. S. DEPARTMENT OF AGRICULTURE:

In October I received a circular giving treatment for actinomycosis. I tried it on three head of cattle, and it worked to a charm. I told other cattlemen, and several have tried the treatment. All are well satisfied but one, who informs me that he could see no change. His steer was very bad. The three I treated had not fully developed, and the veterinarian could not operate at the time. I therefore commenced treatment, and all swelling of the throat disappeared.

Yours, truly,

R. W. PHELPS.

VAN BUREN, ILL., *November 22, 1892.*

BUREAU OF ANIMAL INDUSTRY,
Washington, D. C.:

I treated three 3-year-old feeding steers according to the advice contained in your circular of October 10, 1892, for actinomycosis, or lumpy-jaw, with iodide of potassium. One had a lump under the ear; one on the jaw, and one under and between the jaws. The first was 3 inches in diameter; the second about 3½ by 6 inches long, and the third about 5 inches in diameter. I commenced with 2 drams daily, and increased to 3 drams for twelve days, when the first named was entirely cured. I then gradually decreased to 1½ drams, and at the end of sixteen days the second was cured, the third being cured on the twenty-first day. The three head were all slaughtered at Chicago thirty-five days from commencement of treatment.

Yours, very respectfully,

L. A. KEENE.

WELTON, CLINTON COUNTY, IOWA, *November 26, 1892.*

Dr. D. E. SALMON,
Chief of the Bureau of Animal Industry:

I received a circular from your Bureau on October 18, with instructions for the treatment of lumpy-jaw in cattle with iodide of potassium. The cow I treated is 4 years old, and was bought at a sale for a trifle on account of her jaw. I thought I could cure it with corrosive sublimate, but failed. The jaw had been affected for a year before I began the iodide of potassium treatment. I had it lanced several times,

and for two months it had been running almost constantly. I began the treatment on October 22, and gave 1½ drams every morning for ten days, then every alternate morning for a week, and the lumps are gone and the sore healed up. The cow now appears to be beginning to thrive. In this case, and it was a radical one, the treatment has been a positive success.

Respectfully yours,

JOHN HOWAT.

KING CENTER, MO., *December 2, 1892.*

DEAR SIR: I have been reading of your experiments with iodide of potassium. I would like to tell you of my experience with it. I have been treating "big-jaw" with it for more than a year, and have cured more than twenty cases. * * *

A. J. WHEATLEY.

Hon. J. M. RUSK,

Secretary of Agriculture, Washington, D. C.

CRESTON, IOWA, *December 5, 1892.*

DEAR SIR: I tried your remedy for lumpy-jawed cattle on five steers out of my herd, and it has proved successful in each case.

DANIEL D. DORN.

Hon. J. M. RUSK,

Secretary of Agriculture.

WARSAW, IND., *December 19, 1892.*

DEAR SIR: Some two months ago I asked the Department for a bulletin on "lumpy-jaw." I had a 2-year old Durham heifer with a lump on her jaw the size of a small hen's egg. I purchased 1 ounce of the prescribed remedy, iodide of potassium, divided it into eight portions, and gave as directed, in bran. I saw no change except the softening of the tumor. I bought another quantity, and after a rest of a week gave it in the same manner. The lump has disappeared, except a small callos. The animal's eyes became weak, which is the only change I could see. The last ounce of the remedy I gave in seven doses. I think the heifer is cured of the ailment.

Yours,

A. T. COOK.

Dr. D. E. SALMON,

Bureau of Animal Industry, Washington, D. C.

ALGONA, IOWA, *December 18, 1892.*

DEAR SIR: I cured two lumpy-jaw heifers, a 3-year old and a 2-year old, giving each 1 ounce of iodide of potash, in six doses, two months ago, and as yet there is no sign of a return of the disease.

Very respectfully,

R. W. BARRETT.

Hon. J. M. RUSK,

Secretary of Agriculture.

KIANTONE, CHAUTAUQUA COUNTY, N. Y., *January 2, 1893.*

DEAR SIR: Some time ago we wrote you, asking if the Department had ever made an investigation of the lumpy-jaw in cattle, and we received in reply a circular containing the iodide of potassium remedy, and asked us to report results. We had two cases.

No. 1, a cow in milk, was taken in July. Had four different sores that discharged matter previous to treating her with this remedy. A local veterinarian had advised killing her. One of the sores has entirely healed; the other three are greatly diminished in size. Her flesh has dropped off until she is getting quite thin, and is at the present time and has been for the last three weeks, very stiff. Her eyes discharge very badly; nose but little, and the outer skin looks as if some one had poured her hair full of the coarsest bran. Her appetite is as good as any cow we have.

No. 2, a cow also in milk when taken, but dried off since. She was taken about middle of November, one bunch only. It did not discharge until broken by halter pulling on it. Had treated her ten days. The matter discharged was white, with a yellowish cast, and was very thick and sticky. She discharged from the nose very badly, and also from the eyes, but the outer skin cleaving off was hardly noticeable in this case. She did not drop off in flesh, nor did she show any stiffness. The sore has greatly diminished in size, and think we will have to give her no more medicine, as all that remains is apparently dead flesh, and does not seem sore. We are highly pleased with the remedy so far.

Yours, truly,

S. SPENCER & SON.

Hon. J. M. RUSK,
Secretary of Agriculture, Washington, D. C.

VINE HILL, CONN., *January 27, 1893.*

Patient, thoroughbred Guernsey; age, 8 years; calved July 11, 1892. Observed bunch on left upper jaw November 1, 1892. At this time enlargement was about size of two fists, and very firm. Herdsman then reported to me he had observed swelling in August, 1892. For four days after November 12, administered 2 drams iodide of potassium twice daily. One week later repeated same doses for same period of time. From November 30, for seven days following, gave 2 drams once daily. About one week thereafter administered 1 dram once daily for ten days. From November 12 the swelling rapidly increased in size until November 27, when at about the size of a man's head, it broke. In a few days indications of resolution set in, and for the past six weeks she has, to all intent and purpose, appeared to be perfectly recovered. At this date, the seat of attack is barely visible. The cow's appetite improved shortly after receiving first dose of the iodide, and milk secretion also increased.

F. H. STADTMUELLER,
One of the managers of Vine Hill and Ridge farms, West Hartford, Conn.

FONTANA, MIAMI COUNTY, KANS., *February 1, 1893.*

DEAR SIR: I have tried iodide of potassium for the cure of lumpy-jaw in cattle on 12 head, as prescribed under the treatment made by your direction at Chicago. Nine head, are entirely well; three need further treatment. Five head, with large, lumpy jaws, would have been worthless without the iodide cure. The balance might have got well without it, as they had only bad lumps. I have full 400 head of cattle this winter, and will not have a worthless steer amongst them. The experiment made by your direction has saved me \$200 or \$300. John Shean lost 10 out of his herd of 100 head from lumpy-jaw. He then tried the iodide of potassium remedy on two-

very bad cases, and cured them. I know lumpy-jaw can be successfully treated by farmers and feeders with iodide of potassium. Accept my thanks for the interest you take in the welfare of farmers.

Respectfully, yours,

FRED. MATHEWS.

Hon. J. M. RUSK,

Secretary of Agriculture, Washington, D. C.

Mr. J. W. Wampler, a stock-breeder of Brazilton, Kans., in a letter recently published in the *Kansas Farmer*, says:

I will tell you all I know about curing lumpy-jaw in cattle. Last summer I saw an account in some paper that Secretary Rusk wanted 300 head of lumpy-jawed cattle to experiment on, and he thought he could cure them. I wrote him to send me his remedy and I would experiment, too, as I had three of my own, badly diseased. In a few days I received his answer, and also the remedy, and how different cattle had been treated.

The remedy is iodide of potassium. It costs 30 cents per ounce here in Girard, and 1 ounce will cure one animal if the disease has not gone too long. The longer the disease has run, the more of the iodide of potassium it will take. I use 1 dram in 1 pint of fresh water. It dissolves readily if well pulverized. This much I give to each animal every morning. Don't mix any more than you use each day, as it is better while fresh. Place a good leather halter on the animal and draw its head up by placing the strap or rope over something above. Place a cow horn in its mouth, then pour the medicine through. Repeat every morning unless the animal gets to running too much at the nose, so much that it interferes with its breathing, then stop a day or two, and commence again, and so on, until the animal is well, which, if the disease is not too old, will be in ten or fifteen days.

I have a fine heifer that was badly affected for over a year. The lump on the left side of her head was half as large as her head, and had become honeycombed and running. I fed her 5 ounces and then quit, thinking the disease had gone too far, and left her run, thinking I would kill her and drag her away. We were busy sowing wheat, and did not notice her for some two weeks. I then went to look at and arrange to kill her, as I did not want her to be with the other cattle, but was surprised to see the lump half gone and the remainder soft, and it has been going away ever since, and now she is well.

I cured two steers, also, that had not run so long. One I fed 1 ounce and the other about 2 ounces. I told a neighbor that had three badly diseased. He cured them all. Another neighbor cured three. Another had one that was fat, but had a lump on jaw. He tried to sell it to a shipper, but he would not take it for a gift. He tried the remedy, and in two weeks she was well. He sold her and she went to Kansas City, passed the inspection, went on the market, and he got a good price for her.

Don't get scared if they run at the eyes and nose and the outer coat of skin peels off, like the hair was full of bran, for this is characteristic of the effects of the iodide. The cattle will fatten while under treatment, and so much better and faster afterward, that I am convinced that it would pay to treat all cattle to about 1 ounce to purify the blood and system, especially those put up to feed.

I have given to others that I have not heard from yet, except one that had two steers diseased. I saw him the other day, and asked him how he succeeded in curing the lumpy-jaw? He said he had bought the medicine and laid it up in the kitchen cupboard, and it was there yet. So you can see his cattle have the lumpy-jaw yet.

Tell the people not to buy the medicine unless they intend to use it, and use it right and regular. I will give anyone all I know about curing lumpy-jaw if they will write me, inclosing stamp, and not charge anything, feeling that what is good for me is good for my neighbors.

The report of Dr. V. A. Norgaard is hereto appended.

REPORT OF DR. V. A. NORGAARD, INSPECTOR IN CHARGE.CHICAGO, ILL., *February 6, 1893.*

SIR: I have the honor to submit herewith a report upon the results of experiments in the treatment with iodide of potassium of cattle affected with actinomycosis.

Very respectfully,

VICTOR A. NORGAARD,
Veterinary Inspector.

DR. D. E. SALMON,
Chief Bureau of Animal Industry.

THE MEDICINE.

It has already been mentioned that the medicine used in treating actinomycosis is iodide of potassium. This is a common drug and may be obtained at any drug store, the price being about \$3 per pound.

All the iodine salts have a faint antiseptic power, which is produced by the iodine getting free under a prolonged influence of various organic substances. A 5-per cent solution of iodide of potassium will render tuberculous sputum inactive in about twenty-four hours.

Iodide of potassium has a strong absorbing effect when given internally, especially on all pathological accumulations of cells. In connection with protoplasm, carbonic acid, and water the iodine will become free and combine with the cells in the pathological product, which will decrease their vital power and accelerate their absorption. It still remains to be explained in what that specific effect consists, which the iodine salts has on the actinomyces fungus. Several prominent authorities have investigated the subject, but all have given a different explanation. Nocard succeeded in cultivating actinomyces in gelatine containing 1 per cent of iodide of potassium, but this proves nothing, as the salt in this case will remain unchanged, and in that form has not even a slight antiseptic power. It is not necessary, however, that the iodine should have a specific influence on the fungus to produce that remarkable effect, which the drug evidently exercises on all actinomycotic new formations. This effect may simply be attributed to the strong absorbing power which iodide of potassium exercises on all pathological neoplasms and waste products. The colonies of actinomyces, when living and possessed with regenerative power, are always imbedded in a small amount of liquified tissue surrounded by a wide zone of inflammation. When an actinomycoma consists exclusively of granulomatous tissue and connective tissue, the fungus is dead, or at least dying (Bostroem).

It will therefore be understood that the liquified tissue surrounding the parasite under the influence of the administered iodide of potassium will be absorbed, the soft granulomatous tissue when partly deprived of the necessary pabulum by absorption will undergo a degenerative met-

amorphosis, and the round cells be converted into spindle cells, and the whole actinomycoma in this way will be turned into an inert mass of fibrous tissue, inclosing the dead calcified actinomyces tufts.

The yellow pus-like substance in which the living actinomyces is always imbedded is not true pus, though it has that appearance, but is merely the product of a degenerative metamorphosis (necrobiosis). True pus must contain pus corpuscles and specific pus-producing micro-organisms (pyogenic cocci and bacilli) (Bostroem).

Where iodide of potassium is administered in medium doses for any length of time it will affect not only the diseased parts, but the liberated iodine will combine with the normal cells in the body and produce a series of symptoms called iodism. This consists of a general emaciation, shrinking of the fat, atrophy of lymph glands, and of mammary glands, in connection with a chronic catarrh of nose and conjunctiva, and desquamation of the epidermis. When given in over doses, it will produce a catarrh of the stomach and intestines, and even cause hemorrhages. The manure will get dry and hard and coated with thick mucous, or eventually with blood. All these inconveniences, however, are easily avoided when the medicine is given in proper doses, care being taken that the animal gets plenty of nutritious and easily digestible food. It is not, however, advisable to administer iodide of potassium to milch cows, as it will reduce the milk secretion considerably or stop it altogether. Furthermore a great part of the drug is excreted through the milk, making it unfit for any use. When administered internally the drug permeates all the tissues in the body, even the muscles and bones, but it is, however, rapidly excreted again, especially through the urine and milk.

In treating actinomycosis in cattle with iodide of potassium the dose should never exceed one gram ($\frac{1}{4}$ dram) for every hundred pounds live weight, the proper dose being from 8 to 12 grams (2 to 3 drams) according to the size of the animal and the extent of the lesion. This dose may be given from five to six days, when the animal will show slight symptoms of iodism, viz: discharge of thick mucus from the nose and excretion of tears. The manure will become rather dry, but that is easily repaired by giving a dose of glauber salts and some bran mash. This will restore the appetite, and two days after the last dose was given the animal will be ready for another week's treatment, and so on until a cure is effected. If these precautions are taken, no ill effect will result from the treatment, and if properly fed the animal will gain in condition uninfluenced by the medicine. There is, however, a great difference as to the individual effect of the medicine on animals, but any farmer who takes an interest in seeing his stock doing well will easily perceive when it is time for him to stop and give the animal rest for two or three days.

The medicine is best administered dissolved in water and given by means of a slender, long-necked bottle, for example, a common Rhine-

wine bottle. One dose of medicine is dissolved in about a pint of water, the steer is seized by the nose to hold up the head, and the contents of the bottle is emptied into the mouth without fixing or securing the tongue in any way.

Where a man has several head of lumpy-jawed cattle to treat, they may not be of the same size and therefore not require the same dose of medicine. As the farmer or breeder is not usually in possession of a pair of scales sufficiently fine to weigh off such small doses as required, the most convenient way is to have the medicine, which is easily dissolved, prepared in a concentrated solution of the strength 1 to 2 (2 drams of the solution to contain 1 dram of iodide of potassium). The drug must be dissolved in distilled or rain water, as otherwise a precipitate will form from the salts present in common water. With such a concentrated solution and a measuring glass, it is easy to measure out the exact dose for every animal and pour it into the wine-bottle, half filled with common water.

EFFECT OF IODIDE OF POTASSIUM ON THE DIFFERENT ACTINOMYCOTIC NEW FORMATIONS AND THEIR TISSUES.

To give a detailed description of the various forms under which actinomycosis appears in cattle is not necessary here, as there is an abundance of literature on this subject. It shall only be mentioned that, from a therapeutic standpoint, we may divide them all into two classes: (a) those where the bones are involved and (b) those where only the soft tissue has become affected.

Of the 150 head experimented on, about sixty had lesions where the bone was affected. These may again be divided into two classes: first, where the lesion is located on the lower jaw, which is by far the most common, and, second, those where the facial bones and upper maxilla have become affected. In both cases, the lesion has been produced by an invasion of the germ, by means of a spikelet of barley or some other stiff vegetable particle, on which the germ has vegetated in nature. No other satisfactory explanation of the infection has been given so far, whether the invasion occurred through a decayed tooth or through some abrasion in the mucous membrane in the mouth, on the tongue, or in the pharynx. Bostroem has examined thirty-two cases of actinomycosis in the jaw bones, minutely, and in every case he found some vegetable particle located in the socket of the decayed molar, or in the gums, or even as deep as in the center of the swollen rarefied bone. Where the tongue is affected these foreign bodies may be found in almost every one of the nodules, and a microscopical examination will show them to be closely covered with actinomyces. In five cases of actinomycosis in human beings, this authority has traced the infection back to the same origin, and thereupon advises people who may have that habit not to chew a piece of straw or to put grain, especially those kinds which are armed with a spikelet, in their mouths, as he

feels satisfied that this is the only way in which an infection can take place.

Where the lesion has only affected the soft tissues, the most common appearance is in form of a hard, round or egg-shaped tumor, lying loose in the connecting tissue under the skin, usually in the submaxillary, sublaryngeal, or parotid region. The tumor may vary in size and character, ranging from a walnut to a child's head and from being hard and solid to soft and fluctuating. In almost all cases, bony or soft, the skin that covers the tumor or swelling is more or less indurated and may on the large bony swellings obtain a thickness of 2 or 3 inches. These fibrous indurations, however, show a pronounced inclination to shrink where iodide of potassium has been administered for some time, and will, in most of the cases, disappear altogether, leaving the skin in its natural condition.

The first step toward a medical treatment of actinomycosis was when M. Thomassen, of Utrecht, in 1885, announced that he had successfully treated actinomycosis in the tongue of cattle by giving iodide of potassium internally and applying tincture of iodide to the ulcers on the tongue, which he first scraped. Since then this experiment has been repeated all over Europe by many different authorities and practitioners, with similar success. This lesion, however, is very seldom seen in this country, but seems to be rather common in Germany and certain parts of England. Of all the cattle in this experiment, not one had actinomycosis in the tongue, and the inspectors in the stock-yards have only seen it two or three times. The reason for this may be that actinomycosis in the tongue has a comparatively acute progress, and that an animal so affected rapidly loses in flesh, if medical treatment is not adopted. Now we know, however, that we can always master a case like this, even if the tongue is swollen to such a size that it protrudes from the mouth and is as hard as a board. Give 10 grams ($2\frac{1}{2}$ drams) of iodide of potassium a day, in the above-described way, care being taken to give the animal time to swallow the medicine, as deglutition is impaired considerably by the hard and swollen condition of the tongue. Feed the animal gruel and other fluid food, with a bottle if necessary. In ten to twenty days the tongue will regain its natural size and condition and the animal be enabled to eat hay.

Though none of the cattle in this experiment had the lesion in the tongue, several of them had it in the mucous membrane in the mouth, especially on the inside of the lips, but not to any great extent. It appears as small, flat tumor-formations, the size of a dime to that of a fifty-cent piece, of a reddish-gray color and only protruding a little over the surrounding parts. They will shrink and disappear completely in about two weeks when medicine is administered regularly.

When a medium dose of iodide of potassium has been administered from three days to a week, symptoms of iodism will appear, and at the lapse of two to three weeks a desquamation of the epidermis will take

place, especially on the neck, shoulders, and rump. But there are many exceptions. Some animals will show only a slight catarrh of the nose and none of the conjunctiva, while the desquamation will not take place before a month or six weeks or may not occur at all. Several of the steers experimented upon showed under the whole treatment not a single epidermic scale on their body, even if the dose of medicine was increased up to 15 grams a day. They would get a catarrh of the intestines, with constipation, but show no external symptoms of iodism. Such an insusceptibility of the constitution usually extends to the actinomycotic lesions, which would remain almost unaffected or only improve slightly. There are, however, also exceptions here, as one steer with a large tumor in the sublaryngeal space was almost completely cured without showing any epidermic desquamations.

INDIVIDUALS WHICH SHOW THE MOST PRONOUNCED SYMPTOMS OF IODISM WILL IMPROVE THE FASTEST.

The effect of the medicine is rarely alike in two individuals, even if they are affected exactly the same way and to the same extent. The hard fibrous tumors lying loose in the connective tissue under the skin will require a treatment of from three to six weeks with proper intervals, according to their size. But in many cases a tumor the size of a child's head will shrink and disappear faster than a similar one located on the same place in an animal of the size and condition, but with the tumor only as large as a goose egg; the former will show a pronounced iodism, while the latter will show little or none at all.

When one of those loose fibrous tumors become fluctuating and is left alone, it will break open after a while and a comparatively small amount of pus will be evacuated. The pus cavity will rapidly fill up with the soft granulatous tissue characteristic of actinomycosis, and when it is full it will grow out of the opening like a mushroom and form a granuloma, which will increase in size very fast as long as the supply of nutrition is abundant, after which the surface will begin to ulcerate.

If the treatment is commenced at this time, say with a daily dose of 10 grams of iodide of potassium, the rule is that the ulcerating surface of the granuloma will dry up and the granuloma itself will gradually shrink, apparently as if it were drawn in through the same hole it had grown out of. Then the fibrous parts of the tumor will commence contracting until the whole tumor has disappeared, leaving a small white cicatrix where the granuloma was. But here there are also exceptions. In some cases the granuloma may remain unaffected, while the fibrous parts begin to shrink first, and after a while the granuloma will become dry, shrinking slowly, but not disappearing completely, although the actinomyces are killed or rendered ineffective by the treatment.

When the disease affects the bony parts, the periosteum will become covered with thick layers of connective tissue inclosing centers of soft granulatous tissue, and when it penetrates into the internal parts

the bone will increase in bulk in two different ways, either by a rarefying granulating osteitis or by an ossifying periostitis. The invading germ will cause an irritation, which will be followed by a formation of granulated tissue in the cancelli of the spongiosa and in the Haversian canals. The bony plates of the former and the walls of the latter will be destroyed and replaced by large pockets or alveoli filled with soft granulated tissue and with a creamy, viscid pus-like mass, containing numerous actinomycetes.

The proliferating granulated mass will finally penetrate the surface of the bone and infiltrate the covering tissues, and at last break through the skin, which will become thick and indurated and form a bulky fibrous wall around the fast-growing granuloma. The picture here described is that frequently seen on the lower maxilla. These tumefactions may attain enormous dimensions, and even reach the size of a half-peck measure, with granulomas 6 to 8 inches in diameter. Several specimens of this kind were included in the experiment, though such extreme cases practically never will be submitted to treatment.

Nevertheless, the effect of the medicine by far exceeded the expectations. With a few exceptions, they all showed wonderful improvement. Under the effect of a 12 to 15-gram daily dose, those large fetid ulcerating granulomas would dry up and shrink, most of them disappearing altogether, only leaving a white contracted cicatrix, while the fibrous parts of the tumefaction would become thinner every day and finally leave the swollen bone directly covered by the muscles and the skin. The post-mortem examination of these bony tumors revealed similar improvements. An incision through them showed the internal parts to be spongy, but the alveoli and pockets only contained very little granulated tissue, and this was not soft, but of a more elastic and dense character, and only contained calcified actinomycetes. In many of them no pus was found at all, while others contained small quantities. This remarkable improvement was seen in all those cases where the iodide of potassium had caused a well-pronounced iodism, while in those cases where the medicine had a less pronounced effect the improvement was equally small and quantities of pus and soft tissue could be found in the alveoli. Similar to the loose-lying tumors, the medicine may in these cases have a stronger effect on either the granuloma or the fibrous parts of the tumefaction. The first is the most common, but in a smaller number of cases the medicine takes effect exclusively on the fibrous parts, making them shrink so rapidly that the thick fibrous wall surrounding the granuloma contracts to such an extent that the whole granuloma is expelled, partly by force and partly on account of obstructed blood circulation.

There is no doubt that these results, obtained by a treatment which in no case lasted more than seven weeks and as an average not exceeding five weeks, permit us to say that in iodide of potassium we have found a valuable remedy in treating actinomycosis.

It now remains to decide which cases will prove of financial value for the farmer and breeder to treat, and this partly depends upon the facility with which the administration of the medicine can be performed. The amount of medicine used in a single case ought never to exceed 1 pound, equal to an expense of \$3. We suppose any steer will be worth that much. If the affected animals are being kept in a stable, as, for instance, in distilleries, the trouble about giving the medicine amounts to nothing. But where the animals are running loose in a pasture and there is no convenient place to tie them up it is no easy matter to catch them and secure them every day while the medicine is given. On ranges and similar places, where several hundred head of cattle are kept, the easiest way is to keep the affected cattle in a large pen, in the one side of which is built a narrow chute, into which the cattle can be driven one by one and treated. Such a chute may be constructed out of a few solid boards without much expense. To administer the medicine in the drinking water is not advisable, as it is then rather difficult to control the right dose. The cattle will not drink a pailful of water with a dose of iodide of potassium, except when they are very thirsty.

As to the different lesions, it has already been said that when the tumor is not connected with the bony tissue, but is lying loose in the connective tissue under the skin, a favorable result may be expected in from two to five weeks, according to the size of the tumor and to the susceptibility of the individual toward the effect of the medicine.

It is not necessary to continue the treatment until the tumor has disappeared completely, but it may be stopped when it has shrunk to about one-third of its original size, and the remainder will usually disappear without further treatment. When a small tumor about the size of a hen's egg is located on the cheek or on the outside of the lower jaw, it is usually very hard and can only be moved very little, so it is easily mistaken for a bony tumor. A careful examination, however, will soon prove that it is not bony, and when treatment is commenced it will rapidly decrease in size.

When the bone is affected, treatment is only advisable when the swelling does not exceed a goose egg in size on the lower jaw or a walnut on the upper jaw, and has not penetrated the skin; but in any case the medicine will avert a further development of the disease if the animal is at all susceptible to its effect.

Two cases as above described, and with a small bony tumor on the lower maxilla, were killed on October 29, 1892, after a six weeks' treatment. The bony swellings were then almost solid, contained no large cavities and no traces of pus or soft tissue. In the center of them was a bunch of white connective tissue, and from this extended a cord of the same material to the socket of the first molar. This was an obliterated fistula. The molar was not decayed and was firmly embedded in the socket. This is a clear proof that actinomycotic lesions in the bony tissue can be successfully treated when they are taken in time.

POST-MORTEM EXAMINATION.

November 29, 1892, two lots of cattle experimented upon were killed. Each lot contained forty head, the one consisting of cattle that were supposed to be completely cured, while the second lot included all the old chronic cases, where a successful result could not be expected in the time limited for the experiment.

In the special report of each animal the description of the post-mortem examination will be found. This is necessarily very brief.

The forty cattle which were supposed to be cured proved to be so with the exception of two, which had small actinomycotic tumors in the lung containing living actinomyces. In nine other cases traces of the disease were found at the place where the tumors had been located, but these traces were so insignificant, ranging in size from a pin's head to a bean, that they did not amount to anything.

The first lot were all in good condition, some of them very fat, and the greater part of the second lot also were in a very satisfactory condition, only a few of them being really poor. A noteworthy fact is that only two out of each lot had actinomycotic lesions in the internal organs, all cases in the lungs. This would hardly have been the case if the cattle had not been treated. In some cases a few small nodules, in size from a millet seed to a pea, containing a cheesy, greenish débris mass, were found in the wall of the small intestines, but a microscopical examination of these lesions gave negative results with regard to actinomycosis. The final result of the investigation was that out of the first lot thirty-eight were passed as fit for human food, while the two cases affected with actinomycosis in the lung were condemned. Of the other forty only five were passed and thirty-five condemned, though many of them were big fat steers with the lesion located on the jaws and no internal lesions of any kind. The tumors on the greater part of these did not contain any pus, and the granulomatous tissue had undergone a fibrous metamorphosis, and subsequently did not contain any actinomyces possessed with regenerative power.

December 2 twenty more head of cattle were killed. These had been stabled in the same barn as the rest and had been treated from three to six weeks each with proper intervals. They were all used to the distillery slops before the treatment began and continued to grow in flesh while they were treated. They were all pronounced cases, but only the soft tissues were involved. The lesions were about the same as those in the first lot, hard, fibrous tumors, the size from a goose egg to a child's head, located in the loose connective tissue under the skin in the submaxillary or sublingual space. They all recovered completely, and at the post-mortem examination no traces of the disease were found except in two cases, a hard, fibrous induration in the skin, where the tumors had been. They were all passed as fit for human food.

The notes in regard to the treatment and the post-mortem examination of the individual cases are given in the form of an appendix to this report.

APPENDIX.

No. 535796.

Dark-red hornless steer; received August 22.

In the submaxillary space is located an oblong tumor extending from the chin to the neck, with a dependence of 4 inches. The tumor was of a fibrous condition, but not very hard. In the parotid region on the right side is located a hard, fibrous tumor the size of a goose egg.

Treatment was commenced August 24 with a daily dose of 12 grams and was continued until September 13, at which time the swelling underneath had disappeared and the tumor in the parotid region had shrunk considerably. October 20 the tumor in the parotid region was swelled a little and fluctuating. It was opened with a knife, and a small amount of pus discharged. Medicine was again administered for two weeks, and by November 12 the steer was regarded as cured.

Post-mortem, November 29.—Skin under submaxillary space indurated. Fibrous scar in parotid region. No traces of actinomycosis. No internal lesions. Carcass passed as sound.

No. 45982.

Roan steer, white sides, hornless; received September 5.

In sublaryngeal space on left side is located a hard fibrous tumor the size of a double clinched fist, extending up in parotid region toward the ear. The lower part of the tumor is lying loose under the skin, but the part in the parotid region is in close connection with it.

Treatment was commenced September 7 with a daily dose of 12 grams and was continued until October 12, by which time the tumor had shrunk to the size of a walnut and only left a fibrous induration in the skin in parotid region. The steer was considered cured about October 15.

Post-mortem, November 29.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 33976.

Dark-red steer, white face and rump, horns; received August 28.

In sublaryngeal space in left side is located a fibrous tumor the size of a child's head. The tumor is not quite as hard as is generally the case, but is closely connected with the skin.

Treatment was commenced August 30, with a daily dose of 10 grams, and was continued until October 1. Two weeks later no traces of the tumor could be felt, but in the skin was still left a thick fibrous induration. Medicine was again administered until November 1, by which time the skin had almost regained its natural condition. About November 10 the steer was considered cured.

Post-mortem, November 29.—Slight thickening of the skin in sublaryngeal space. No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 39963.

White roan steer, hornless; received August 28.

In parotid region on the left side is located a tumor the size of a large goose egg, which at the lower end extends into a hard fibrous swelling, filling the intermaxillary and sublaryngeal space, depending about 5 inches below the throat.

The treatment was commenced August 30, with a daily dose of 10 grams. The medicine had a good effect, causing a strong catarrh of nose, mouth, and conjunctiva and made the tumor and swelling shrink rapidly. After four weeks the treatment was stopped and the steer regarded as cured about October 10.

Post-mortem, November 29.—The skin that covered the tumor a little indurated. No traces of the disease left here nor internally. Carcass passed as sound.

No. 499857.

Red steer, white star, rudiments of horns; received August 16.

In the sublaryngeal space on the right side is located a tumor the size of a clinched fist. The tumor is hard and fibrous with a smooth surface and lying loose under the skin.

The treatment was commenced August 18 and continued for three weeks with daily dose of 10 grams. The medicine had a strong effect on the steer, and already, September 12, the tumor had completely disappeared. In spite of a well-defined iodism the steer did not lose flesh under the treatment, but his condition improved considerably.

Post-mortem, November 29.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 545801.

Speckled dehorned steer, white face; received August 22.

In sublaryngeal space on right side is seen a tumor the size of a clinched fist located in loose connective tissue under the skin. The tumor is hard and fibrous with no evidence of having been opened.

Treatment was commenced August 24; daily dose, 10 grams. The tumor began to shrink from the fourth day, and in less than three weeks it had gone down to the size of a walnut. The steer was then covered all over with epidermic scales, and was considered cured about October 7.

Post-mortem, November 29.—No traces of the disease were found either on neck or internally. Carcass was passed as sound.

No. 545523.

Brindle steer, hornless; received August 16.

On the outside of the right cheek, near the lower edge of the inferior maxilla, is located a hard fibrous tumor the size of a goose egg. The tumor is situated in the short connective tissue under the skin. In submaxillary space there is a similar tumor the size of a double clinched fist.

Treatment was commenced August 18, with a daily dose of 10 grams, and was continued until September 12. The steer showed a pronounced iodism, and the tumors shrunk rapidly. When the treatment was stopped the tumor in submaxillary space had disappeared, and the other one had shrunk to the size of a walnut. October 1 the steer was considered cured.

Post-mortem, November 29.—No traces of the tumors left, except a slight induration in the skin. No internal lesions. Carcass passed as sound.

No. 534024.

Brindle steer, horns; received August 22.

On left cheek outside second molar is located a hard fibrous tumor the size of a walnut. It is situated in the short connective tissue under the skin and can only be moved very little. In the intermaxillary space there are two tumors, the foremost one a little larger than the above mentioned, and the other one about the size of a double clinched fist.

The treatment was commenced August 24 with a daily dose of 10 grams. Two weeks later the two smaller tumors had disappeared, and by September 20, when the treatment was stopped, there was only a small part of the largest one left.

Post-mortem, November 29.—In intermaxillary space was found a small fibrous induration the size of a robin's egg. The surrounding lymph glands were a little swollen, but sound. The carcass was passed as sound.

No. 545512.

Red dehorned steer, white triangular spot on left side; received August 16.

On the left cheek are located four hard fibrous tumors from the size of a walnut to a hen's egg. They form a line from the angle of the mouth toward the back edge of the jaw, the last one being located a little below the ear. They are very hard and can only be moved slightly. In sublaryngeal space on left side is located a tumor the size of a double clinched fist.

Treatment was commenced August 18 with a daily dose of 10 grams, and was continued until September 10, at which time the four tumors on the cheek had disappeared and the one on the throat had shrunk to the size of a hen's egg. September 25 the steer was regarded as cured.

Post-mortem, November 29.—One of the sublaryngeal lymph glands contained a small actinomycoma the size of a bean. No traces left of the tumors, excepting a small induration in the skin covering the throat. No internal lesions. Carcass passed as sound.

No. 39964.

Red spotted steer, white star; received August 28.

The right lower maxilla is swollen to the size of a goose egg, between the incisor and the first molar. The bony swelling is covered with a layer of fibrous tissue, which makes the swelling appear the size of a double clinched fist. In the submaxillary space are a couple of small soft swellings the size of walnuts.

Treatment was commenced September 1, with a daily dose of 12 grams and was continued until October 30, with proper intervals. By this time the swollen glands in the submaxillary space had regained their normal size and condition, while the tumor on the jaw had only shrunk very little, but had become considerably harder. Only on the lower part of it was left some of the fibrous covering. The bony swelling seemed to have increased a little in size, while the fibrous tissue was absorbed.

Post-mortem, November 29.—Small fibrous infarct in sublingual lymph gland. The bony swelling was spongy, but did not contain any pus cavities. It was covered by a thin layer of fibrous tissue, which on the lower side of the swelling inclosed a small soft granuloma. In the wall of the small intestines were located a few small round hard nodules.* One of the mesenteric glands was a little enlarged. By the microscopic examination no actinomyces was found in any of these. No other internal lesions. Carcass passed as sound.

*These nodules, which are frequently mentioned in the post-mortem notes, have nothing to do with actinomycosis or lumpy jaw. They are very common in healthy cattle and are caused by animal parasites.—D. E. S.

No. 545742.

Brown steer, horns; received August 22.

On the right cheek is located a hard fibrous tumor the size of a hen's egg outside the third molar. In the submaxillary space there is another tumor the size of a cocoanut. The lower part of this tumor was fluctuating, and consequently was opened with a knife. It only contained about one ounce of pus. The rest of the tumor was hard and fibrous.

Treatment was commenced August 24, with a daily dose of 10 grams, and was continued until September 1, with proper intervals. The medicine did not have any strong effect, the tumors only shrinking slowly. October 7 there was still left a tumor the size of a goose egg under the jaw, while there only remained a small fibrous bunch from the tumor on the cheek. Medicine was then again administered for three weeks, and by November 12 the steer was considered cured.

Post-mortem, November 29.—No traces of the disease left except a small fibrous cicatrix on the cheek and a fibrous induration in the skin in submaxillary space. No internal lesions. Carcass passed as sound.

No. 545559.

Light brown Montana-Texas steer; received August 16.

In right parotid region is located a hard fibrous tumor the size of a goose egg. In the submaxillary space on right side there is a similar tumor the size of a double clinched fist lying loose in the connective tissue under the skin.

Treatment was commenced August 18 with a daily dose of 10 grams, and was continued until October 1, with proper intervals. The steer showed no symptoms of iodism, the tumors shrinking only slowly, especially the one in the parotid region. From November 1 to November 15 medicine was again administered, and soon afterwards both tumors had disappeared, the upper one leaving a small fibrous induration on the angle of the lower maxilla.

Post-mortem, November 29.—No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 540519.

Black steer, dehorned; received August 16.

On the right side of the face, between eye and nose, is located a bonyswelling the size of a hen's egg, with a scar on the top, indicating that it has been suppurating. On the right cheek, outside the third molar, is located a hard fibrous tumor, the size of a goose egg, lying loose in the connective tissue under the skin. In sublingual space there is located another tumor the size of a double clinched fist.

The treatment commenced August 18, with a daily dose of 10 grams of iodide of potassium, and was kept up for four weeks, with the exception of one or two days a week. The tumor on the cheek and under the throat soon commenced to shrink, while the bony one broke open and discharged a little pus, after which it healed up again. At the end of the fourth week the two fibrous tumors had gone down to about one-third the original size, and the treatment was stopped. Three weeks later they had almost disappeared, while the bony one was exactly the same size as before the treatment. From October 15 to October 24 medicine was again administered daily, but the bony tumor remained unchanged.

Post-mortem, November 29.—The bony swelling on right upper maxilla consisted of solid bone, and contained neither pus nor soft tissue. No traces were left of the other tumors. No internal lesions. Carcass passed as sound.

No. 545797.

Red hornless bull; received August 22.

On the right lower maxilla, outside the first molar, is located a hard fibrous bony tumor the size of a clinched fist. In submaxillary space on left side is seen another tumor, the size of a child's head, lying loose in the connective tissue under the skin. The skin covering the lower part of the tumor is fibrous indurated.

Treatment was commenced August 24, with a daily dose of 10 grams of iodide of potassium, and was continued until October 15, with proper intervals. The tumor under the throat had then gone down to the size of a goose egg, while the fibrous parts of the bony swelling on the lower jaw had disappeared, leaving it bony, hard, and the size of a hen's egg. November 15 the tumor under the throat had disappeared completely, only leaving a fibrous thickening in the skin.

Post-mortem, November 29.—Fibrous induration in skin under throat. An incision through the bony swelling shows this hard and solid, with no cavities, but with a small fibrous mass in the center, from which the obliterated remainders of a fistula goes up to the socket of the first molar. No lesions internally. The carcass was passed as sound.

No. 59141.

Dark red steer, hornless, roan face; received August 28.

The entire intermaxillary and sublaryngeal space is occupied by an oblong and rather soft tumor. The skin covering the tumefaction is indurated, and closely attached to the underlying tissue. The tumor depends about 5 inches below the lower edge of the under jaw.

Treatment was commenced about August 30, with a daily dose of 12 grams, and was continued until October 5, with proper intervals. The steer showed a pronounced iodism, and the tumor shrunk rapidly, but for a long while the skin remained very thick and indurated. This, however, disappeared slowly after the treatment was stopped. About October 20 the steer was regarded as cured.

Post-mortem, November 29.—In intermaxillary space is located a flat fibrous induration, about 2 inches long and 1 inch thick, inclosing a small abscess the size of a bean, containing thin yellow pus. No actinomyces was found by microscopical examination. No internal lesions. Carcass passed as sound.

No. 45983.

Red steer, hornless, white star; received September 5.

On the left side of the face, about 3 inches below the eye, is located a hard bony swelling the size of a clinched fist.

Treatment was commenced September 7 with a daily dose of 12 grams, and was continued until November 1. The steer showed a pronounced iodism, but the size of the tumor remained almost unchanged.

Post-mortem, November 29.—The thin fibrous covering on the bony swelling contained a few small pockets the size of peas. The contents of these pockets had originally been soft granulomatous tissue, but consisted now of a fibrous homogeneous mass of a light yellow color, but still bearing resemblance in structure to the former tissue, which during the treatment had undergone a fibrous metamorphosis. On the cut surface these centers protruded a little over the indurated tissue in which they were embedded, showing that they had been under a pressure. The internal parts of the bony swelling were spongy, but contained neither soft tissue nor pus. The lymph glands on the head were sound. No internal lesion. Carcass was passed as sound.

No. 40001.

Roan heifer, horns; received August 22.

The left cheek, from the eye down to the lower edge of the jaw, is covered by a hard fibrous tumor, which is fluctuating on the most prominent part. It was opened with a knife and a few ounces of good yellow pus evacuated.

Treatment was commenced August 24, with a daily dose of 10 grams, and was continued until October 10, with proper intervals. The heifer showed only slight symptoms of iodism, and the tumor only shrunk slowly. When the treatment was stopped another abscess formed in the same place, which was also opened. From October 20 to November 10 medicine was again administered, and the tumor was considerably reduced in size.

Post-mortem, November 29.—On the right cheek is located a fibrous induration about 1 inch thick and 3 inches in diameter, containing slight traces of soft tissue centers. The lymph glands on the head were sound. No internal lesions. Carcass passed as sound.

No. 39974.

Spotted roan steer, horns; received August 28.

On the right lower maxilla, below the first molar, is located a fibrous bony swelling the size of a clinched fist. In the intermaxillary space there is a hard fibrous tumor about the same size, lying loose in the connective tissue under the skin.

Treatment was commenced August 30, with a daily dose of 12 grams, and was continued until October 20, with proper intervals. The steer showed a pronounced iodism, and the tumor in the intermaxillary space disappeared completely, while the swelling on the lower jaw was reduced to the size of a goose egg by the shrinking of the fibrous covering.

Post-mortem, November 29.—No traces of the fibrous tumor left, except a small induration in the skin. Surrounding lymph glands sound. An incision through the bony swelling showed this to be solid bone throughout, with the exception of a small bunch of white connective tissue in the center, from which a cord of the same material leads to the socket of the second molar. No internal lesions. Carcass passed as sound.

No. 45594.

Dark red steer, horns; received September 12.

In the loose connective tissue in the submaxillary space is located a tumor the size of a double clinched fist.

Treatment was commenced September 14, with a daily dose of 12 grams, and was continued until October 10, by which time the tumor had shrunk to the size of a walnut. About October 25 the steer was considered cured.

Post-mortem, November 29.—Small, fibrous induration in the skin in submaxillary space. No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 25873.

Dark red steer, hornless, white star and white spot on left hip; received September 12.

The intermaxillary space is completely filled from the chin to the neck with a fibrous swelling, which, on the left side, extends up into the parotid region toward the ear. The swelling is rather soft, and is closely connected with the indurated skin.

The treatment was commenced September 14, with a daily dose of 10 grams, and was continued until October 25, by which time the swelling had disappeared, but

the skin was still hard and very thick. This, however, improved rapidly, and by November 12 the steer was considered cured.

Post-mortem, November 29.—No traces of the swelling left. No internal lesions. Carcass passed as sound.

No. 546042.

Blue roan steer, hornless; received August 22.

In the sublaryngeal space on the left side is located a hard fibrous tumor the size of a coconut, lying loose in the connective tissue under the skin.

Treatment was commenced August 24, with a daily dose of 12 grams, and was continued until October 7, with proper intervals. The steer showed no symptoms of iodism whatever, and when treatment was stopped the tumor had only shrunk to about one-half its original size. Medicine was again administered from October 20 to October 31, during which time the tumor improved rapidly. About November 12 the tumor had disappeared, only leaving a thick induration in the skin.

Post-mortem, November 29.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 48040.

Red steer, hornless; received August 30 from Kansas City.

In the sublaryngeal space on left side is located a hard fibrous tumor the size of a child's head, lying loose in the connective tissue under the skin. In right parotid region there is a hard, flat, fibrous swelling, which is closely connected with the skin.

Treatment was commenced September 1, with a daily dose of 12 grams, and was continued until October 1, with proper intervals. By this time the tumor under the throat had shrunk to the size of a hen's egg, while the swelling in the parotid region had become considerably reduced. About October 20 the steer was regarded as cured.

Post-mortem, November 29.—No traces of the tumors left, except a fibrous thickening in the skin in the parotid region. No internal lesions. Carcass passed as sound.

No. 39985.

Red steer, white face, white rump and legs; received August 28.

In the loose connective tissue in the submaxillary space are located three hard fibrous tumors the size of goose eggs. The skin covering them is considerably indurated.

Treatment was commenced August 30, with a daily dose of 12 grams, and was continued until September 20, by which time the tumors had shrunk to the size of a walnut, and the induration in the skin had become thinner. October 18, the steer was considered cured.

Post-mortem, November 29.—Slight induration of skin in submaxillary space. No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 45953.

Red steer, white star, hornless; received September 5.

In left parotid region is located a hard fibrous tumor the size of a goose egg. In the sublaryngeal space on left side there is a similar one the size of a double clinched fist. The first one is closely connected with the underlying tissue, but the other one is located in the loose connective tissue under the skin.

Treatment was commenced September 7, with a daily dose of 12 grams, and was continued until October 7, with proper intervals. By this time both tumors had shrunk considerably, and about October 28 the steer was regarded as cured, though there was still left a small deeply situated induration in the intermaxillary space.

Post-mortem, November 29.—In the intermaxillary space is located a small, flat, fibrous induration the size of a walnut, inclosing three granulomas the size of beans. The skin in left parotid region a little indurated. No internal lesions. Carcass passed as sound.

No. 22485.

Red steer, white face, horns; received August 30 from Kansas City.

In the submaxillary space are located three hard fibrous tumors the size of goose eggs, and in the right parotid region there are two similar tumors, the lower one the same size and the upper one the size of a hen's egg. The skin covering the tumors in submaxillary space is hard and thickened.

Treatment was commenced September 1, with a daily dose of 12 grams, and continued until October 15 with proper intervals. The steer only showed slight symptoms of iodism, and the tumors shrunk rather slowly. When treatment was stopped none of the tumors were larger than a walnut. About November 10 the steer was considered cured.

Post-mortem, November 29.—In the intermaxillary space were found two small fibrous indurations, each containing a couple of small soft granulomas the size of a pea. No internal lesions. Carcass passed as sound.

No. 39994.

Red steer, horns; received August 28.

The intermaxillary space is completely filled, from the chin to the neck, with a fibrous swelling of rather soft condition. The skin is closely connected with the underlying swelling.

Treatment was commenced September 1, with a daily dose of 12 grams, and was continued until September 30, by which time the swelling had shrunk considerably. October 12 the steer was regarded as cured.

Post-mortem, November 29.—The skin that covered the swelling is fibrous indurated. No traces of actinomycetes to be found. No internal lesions. Carcass passed as sound.

No. 44531.

Red steer, horns; received September 12.

In sublingual region on left side is located a hard, fibrous tumor the size of a double-clinched fist, lying loose in the connective tissue under the skin.

Treatment was commenced October 14, with a daily dose of 12 grams, and was continued until October 15, by which time the tumor had shrunk to the size of a hen's egg. November 10, the steer was considered cured.

Post-mortem, November 29.—One of the submaxillary lymph glands was swollen to the size of a walnut, and contained an abscess the size of a bean, filled with pus containing actinomycetes. Sublingual lymph gland in right side indurated. No internal lesions. Carcass passed as sound.

No. 25386.

Red steer, white star, roan spot on right side and left thigh, hornless; received September 12, 1892.

In the loose connective tissue in the submaxillary space is located a hard fibrous tumor the size of a child's head.

Treatment was commenced September 14, with a daily dose of 15 grams, and was continued until October 12, by which time the tumor had shrunk to the size of a hen's egg. October 25, the steer was regarded as cured.

Post-mortem, November 29.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 534041.

Dark red, Hereford-crossed steer, white on hips; received August 22.

In the left parotid region is located a hard, flat, fibrous swelling, which at the lower end extends into a tumor the size of a child's head, located in the sublaryngeal space. Two inches in front of this tumor, in the submaxillary space, there is another one the size of a goose egg.

Treatment was commenced September 24, with a daily dose of 12 grams, and continued until October 1. The steer showed no symptoms of iodism, and no desquamation of the epidermis appeared under the whole treatment. Nevertheless the tumors shrunk rapidly, especially the largest one in the sublaryngeal space. October 16, the steer was regarded as cured.

Post-mortem, November 29.—In one of the submaxillary lymph glands was located a granuloma the size of a bean. The skin in the parotid region a little indurated. No internal lesions. Carcass passed as sound.

No. 40002.

Black speckled heifer, hornless; received August 22.

In the loose connective tissue in the intermaxillary space is located a hard fibrous tumor the size of a double clinched fist.

Treatment was commenced August 25, with a daily dose of 10 grams, and was continued until September 20. By this time the tumor had almost disappeared, and by October 1 the steer was considered cured.

Post-mortem, November 29.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 131056.

Red steer, horns, white on left flank; received September 5.

In the sublaryngeal space on left side is located a hard fibrous tumor the size of a double clinched fist, lying loose in the connective tissue under the skin.

Treatment was commenced September 7, with a daily dose of 10 grams, and was continued until October 7, with proper intervals. By this time the tumor had shrunk to the size of a walnut. October 20 the steer was regarded as cured.

Post-mortem, November 29.—No trace of the tumor left. No internal lesions. Carcass passed as sound.

No. 25150.

Red steer, horns; received September 5.

In the sublaryngeal space on the right side is located a hard fibrous tumor the size of a cocoanut, lying loose in the connective tissue under the skin.

Treatment was commenced September 7, with a daily dose of 12 grams, and was continued October 1. The steer showed a pronounced iodism, and the tumor shrunk rapidly. October 15 the steer was considered cured.

Post-mortem, November 29.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 25162.

Red steer, white star, horns; received September 12.

In the sublaryngeal space on the left side is located a tumor the size of a child's head. On the lower end of it, the skin is in close connection with the tumor, and out through the skin extends a round soft granuloma, about 4 inches in diameter and 1 inch thick. The surface of the granuloma is uneven and covered with pus crusts.

Treatment was commenced September 14, with a daily dose of 14 grams, and was

continued until October 20. with proper intervals. The granuloma began to dry up right away, and in the third week it had shrunk to a level with the surrounding parts and was covered with epidermis. When the treatment was stopped the tumor had gone down to the size of a hen's egg, with a small white scar at the place where the granuloma was, surrounded by heavy wrinkles of skin. About November 12 the steer was regarded as cured.

Post-mortem, November 29.—Small fibrous thickening in the skin where the tumor was. No internal lesions. Carcass passed as sound.

No. 131035.

Red steer, horns, white star and spot on shoulder; received September 5.

In the sublaryngeal space on the left side is located a fibrous tumor the size of a child's head. It is lying loose in the connective tissue under the skin.

Treatment commenced September 7, with a daily dose of 12 grams, and was continued until October 10, with proper intervals. By this time the tumor had sunk to the size of a goose egg, and the rest disappeared without further treatment. October 25 the steer was considered cured.

Post-mortem, November 29.—One of the submaxillary lymph glands showed a fibroid degeneration, having evidently contained an actinomycoma, which under the treatment had undergone a fibrous metamorphosis. No trace of the tumor was left except a fibrous induration in the skin. No internal lesions. Carcass passed as sound.

No. 25870.

Dark red steer, hornless; received September 12.

In the left parotid region is located an extensive, flat, hard, fibrous swelling, which below extends into a tumor filling the intermaxillary space.

Treatment was commenced September 14, with a daily dose of 15 grams, and was continued until October 15. By this time the tumor below had shrunk to about one-third its original size, while the swelling in the parotid region remained almost unchanged, though not quite as prominent as before. November 1 the treatment was commenced again, and the tumors now began to improve rapidly. November 10 treatment was discontinued, and shortly afterwards the steer was considered cured.

Post-mortem, November 29.—One of the sublaryngeal lymph glands contained an abscess the size of a hazelnut, in which was found yellow pus with actinomyces. No internal lesions. Carcass passed as sound.

No. 39984.

Dark red, hornless steer; received August 28.

In the sublaryngeal space on the right side is located a tumor the size of a child's head. It is lying loose in the connective tissue under the skin.

Treatment was commenced September 1 with a daily dose of 10 grams, and continued until October 10. The steer showed marked symptoms of iodism and the medicine had a good effect on the tumor. When the treatment was stopped there still remained a tumor the size of a hen's egg, covered by a rather extensive hard induration in the skin. November 1 the tumor had completely disappeared, and even the induration in the skin had grown thinner.

Post-mortem, November 29.—Fibrous thickening in skin under larynx. One of the sublingual lymph glands contained a very small actinomycoma the size of a large pin head. No internal lesions. Carcass passed as sound.

No. 48056.

Red steer, hornless, speckled body, white belly; received August 30, from Kansas City.

The intermaxillary space is completely filled with an oblong tumor, extending

from the chin to the neck, and depending about 3 inches below the lower edge of the jaw. The tumor is hard and fibrous and in close connection with the skin. On the inside of the upper lip are located two soft red actinomycomas about the size of a nickel.

Treatment was commenced September 1st, with a daily dose of 12 grams, and was continued until October 7, by which time there only remained a fibrous induration in the skin under the jaw. The actinomycomas inside the lip had disappeared during the third week of the treatment. The steer was considered cured about October 15.

Post-mortem, November 29.—No traces of the disease left under the jaw or in the mouth. No internal lesions. Carcass passed as sound.

No. 48037.

Red steer, hornless, received August 30, from Kansas City. On both cheeks outside the third molar is located a hard fibrous tumor the size of a hen's egg. They are situated in the short connective tissue under the skin, and as they are hard and can only be moved slightly, give the impression that they are bony. In the loose connective tissue in submaxillary space there is another tumor the size of a clinched fist.

The treatment was commenced September 1st with a daily dose of 12 grams, and was continued until October 1, at which time there was only a small trace left of the tumors. October 12 the steer was regarded as cured.

Post-mortem, November 29.—The sublingual lymph glands were a little swollen, but no traces of the tumors were left. No internal lesions. Carcass passed as sound.

No. 48,020.

Red steer, hornless, brockled face, white on shoulder and hip; received August 20 from Kansas City.

In right parotid region is located a hard, fibrous tumor the size of a goose egg, and another one, the size of a child's head, is seen in the loose connective tissue in the sublingual space.

Treatment was commenced September 1, with a daily dose of 12 grams iodide of potassium, and was continued until October 10. The steer showed very pronounced iodism, and the tumors shrunk fast. October 28 they had disappeared.

Post-mortem, November 29.—No traces of the disease left except a small callous in the skin where the tumors had been. No internal lesions. Carcass passed as sound.

No. 533950.

Red steer, white face, shoulder and rump; received August 22.

On the back edge of the right lower jaw is located a fluctuating tumor the size of a goose egg, and two hard fibrous tumors of the same size in submaxillary space.

Treatment was commenced August 24, with a daily dose of 10 grams. The abscess was opened with a knife, and a few ounces of thick yellow pus evacuated. The pus did not contain actinomyces. The treatment was continued until September 20. The tumors shrunk rapidly and had disappeared about October 2.

Post-mortem, November 29, 1892.—In the submaxillary space was left a small, fibrous induration containing two abscesses the size of beans. The contents of these was a thin yellow pus. The microscopic examination proved actinomyces to be present. Treatment was stopped a little too soon. Carcass passed as sound.

No. 25854.

Red hornless steer; received September 12.

In right parotid region is located a fibrous tumor the size of a goose egg, and

another the size of a child's head is seen in submaxillary space. Both are hard, round, and with a smooth surface lying loose under the skin.

Treatment was commenced September 14, with daily dose of 12 grams. Both tumors shrunk very fast, and one month later had gone down to one-third their original size. No more medicine was given and about November 12, the steer was considered cured.

Post-mortem, November 29.—Fibrous induration of skin underneath the throat. No traces of actino. In the liver there were two small abscesses the size of hazelnuts. Microscopic examination proved they were not caused by actinomycosis. The carcass was passed as sound.

No. 45943.

Brown hornless steer, white star; received September 5.

In left parotid region is located a hard fibrous tumor the size of a double clinched fist, and another one the same size in submaxillary space.

Treatment was commenced September 7 with a daily dose of 12 grams, and was continued until October 15. The tumors shrunk fast and by November 12 no trace of them was left, not even in the skin.

Post-mortem, November 29.—Neither on the head nor in the internal organs was any of the disease found. The carcass was passed as sound.

No. 39988.

Dark red steer, hornless, received August 28.

The right lower maxilla below the first molar is swollen to the size of a double clinched fist. It is bony, hard, but the covering skin is thick and indurated, and closely attached to the underlying tissue.

Treatment was commenced, August 30, with a daily dose of 12 grams, and was continued until October 20, with proper intervals. The steer showed a pronounced odism, and the tumor shrunk a little and became bony hard.

Post-mortem November 29.—In the indurated skin on the swelling was located a few small centers of soft tissues the size of peas. The internal tissue of the bone was rather solid, only a trifle spongy with no traces of the disease. The lymph glands on head were sound. No internal lesions. Carcass passed as sound.

No. 39992.

Black hornless steer, August 28, 1892.

Bony swelling of right lower maxilla, similar to above No. 39988. Treatment the same.

Post-mortem, November 29.—The internal parts of the swelling were spongy, and contained several centers of soft tissue the size of hazelnuts. No pus was found. Lymph glands sound. No internal lesions. Carcass was condemned.

No. 130915.

Red white-speckled steer; white star and horns; received August 30.

All the facial bones on the right side of the head are immensely swollen from the edge of the lower eyelid down to the nose. There is hardly any fibrous covering on the bony parts, except below, where the tumor gradually goes over on the lower maxilla. On the most prominent part of the swelling is an ulcer the size of the palm of a hand, located about 4 inches below the eye. The lachrymal duct is obliterated so that the tears run down over the tumor.

Treatment was commenced September 1st, with a daily dose of 15 grams and continued to October 25, with proper intervals. The medicine caused well-marked

symptoms of iodism, but the tumor remained almost unchanged, the fibrous swelling on the lower jaw shrinking a little. The ulcer dried up and left a small scar 1 by 2 inches. As no further improvement could be expected the treatment was stopped.

Post-mortem, November 29.—An incision through the bony swelling shows this completely filled with numerous cavities the size of peas, filled with pus and soft tissue, both containing actinomyces. No lesions in internal organs. Carcass condemned.

No. 545524.

Red dehorned steer, white star, white on left fore knee, side, and hip; received August 16, 1892.

The left lower maxilla is immensely swollen from the mouth and backwards. On the lower part of the swelling, which occupies the whole intermaxillary space, and has a dependence of 5 to 6 inches below the original edge of the jaw, is located an ulcerating granuloma about 7 inches in diameter, protruding about 3 inches over the surroundings. The deeper parts of the swelling are hard like bone, covered with a thick layer of fibrous tissue, which around the granuloma forms a heavy swollen wall 2 to 3 inches thick. Upwards the fibrous part of the tumor extends over the upper jaw and the parotid region, gradually growing thinner up against the eye and ear. The skin covering the tumor is closely connected with it all over. The surface of the granuloma is uneven, covered with crusts, and small drops of pus constantly ooze out at many different places. The base of the granuloma is a little smaller than the circumference of it. A 2-inch deep fissure separates the edges of the granuloma from the epidermis covered parts. The steer is constantly grinding his teeth and slobbering from the mouth. Condition rather poor.

The treatment was commenced August 18 with a daily dose of 12 grams, and was continued until October 25, with proper intervals. The tumor apparently did not shrink much, though the fibrous parts of it, especially on the upper jaw, were reduced considerably. The granuloma dried up, but shrunk only very slowly. By November 12 there was only a scar about 5 inches in diameter left at the place where the base of the granuloma was, and the fibrous wall which surrounded it had also grown considerably thinner, but is now the most prominent part, as it has not shrunk as fast as the granuloma.

Post-mortem, November 29.—An incision through the bony tumor shows numerous alveoli filled with soft granular tissue containing very little pus. Directly above the scar on the lower surface is a large granuloma the size of a goose egg. The consistence of this is not soft as usual, and contains less pus. In this actinomyces were found.

In the wall of the small intestines was located a few hard small nodules the size of millet seeds, containing a dry mass, consisting mostly of limesalts. No actinomyces were found. Other internal organs sound. Carcass condemned.

No. 554819.

Red steer, white star, white left shoulder and rump, dehorned; received August 16.

The right lower maxilla is immensely swollen from the ramus to the angle. The swelling is bony and covered with a thick fibrous layer, which extends up over the cheek towards the eye. Underneath it occupies the whole intermaxillary space and has a dependence of 4 inches.

The treatment commenced August 18 with a daily dose of 12 grams and was continued until September 25. The fibrous parts of the swelling had by this time shrunk considerably, leaving the tumor hard as bone. The swelling on the upper jaw had almost disappeared, only in the submaxillary space there remained a good deal of fibrous covering. The treatment was then continued for three weeks more without much improvement.

Post-mortem, November 29.—The fibrous tissue covering the lower part of the bony swelling contained a few deposits of soft tissue, while the bony swelling contained several cavities filled with the same and a few filled with pus. No internal lesions. Carcass condemned.

No. 48087.

Red steer, white star and shoulder, hornless; received August 30 from Kansas City.

The right ramus of the lower maxilla is swollen to an enormous size. The swelling fills the entire intermaxillary space from the chin to the neck and extends up over the right cheek toward the eye. The deeper parts of the swelling are hard, covered with a thick layer of fibrous tissue, which on the lower part of the swelling is 4 or 5 inches thick. There is located at this point an ulcerating granuloma 6 to 8 inches in diameter and protruding 3 to 4 inches over the swollen margin of the surroundings. The surface of the granuloma is uneven, partly raw and bleeding, and partly covered with crusts of pus, which is constantly discharged through numerous minute openings on the surface. The ulcer has a very fetid odor. The skin covering the tumefaction is closely attached to the underlying tissue. The entire swelling was fully the size of a gallon jug.

Treatment was commenced September 1 with a daily dose of 15 grams and was continued until November 1, with proper intervals, two of which extended over a week each. The steer showed a pronounced iodism, and, though the manure constantly was rather hard, the steer did not lose in condition. The ulcerating surface of the granuloma soon began to dry up and no more pus was discharged. The swollen indurated margins shrunk and contracted considerably, and by this contraction the whole granuloma, which then had shrunk to the size of a clinched fist, was expelled, leaving a dry scar. The softer parts of the swelling, especially in the submaxillary space and the parts extending up over the cheek, disappeared almost entirely, leaving the bony part closely covered by the indurated skin.

Post-mortem, November 29.—The skin covering swelling is indurated and about three-fourths of an inch thick. On the lower part of the tumefaction is seen a white contracted cicatrix 3 to 4 inches in diameter, and in the thin fibrous covering of the bony swelling were a few small centers of reddish granular tissue. A section through the bone shows this spongy and filled with numerous centers and pockets containing yellow pus of a rather slimy character, and several cavities filled with soft red tissue interrupted by the characteristic small yellow spots. All the surrounding lymph glands were perfectly sound and no lesions were found in the internal organs. The carcass, though it was in splendid condition, was condemned.

No. 48247.

White roan steer, horns; received August 30 from Kansas City.

Immense swelling of right lower maxilla with ulcerating granuloma. Case similar to above number (48087).

Post-mortem, November 29.—The granuloma had not disappeared altogether. It shrunk to the size of a hen's egg and was rather hard and dry. The fibrous tissue covering the bony swelling contained several small centers of soft tissue. An incision through the bony swelling shows this to be spongy, with numerous pockets and cavities filled with soft red tissue and pus. The lymph glands on head were sound. Carcass condemned.

No. 534031.

White steer, dehorned; received August 22.

The left side of the face from the eye down to the nose, is immensely swollen. The swelling is of a bony consistency, the covering skin only a little indurated. On the

most prominent part, 3 inches below the eye, there is an ulcer 4 by 5 inches in diameter and only protruding a little over the surrounding parts. On the surface of the ulcer, which is covered by dry pus crusts, 3 fistulas open out, constantly discharging a little yellow inodorous pus.

Treatment was commenced August 24 with a daily dose of 15 grams, and was continued until October 7, with proper intervals. By this time the fibrous part of the swelling had shrunk considerably, leaving the rest hard like bone. The ulcer had healed up, but one of the fistulas was still discharging a little pus. Medicine was again administered for two weeks without any noticeable improvement as to the size of the swelling, but no more pus was discharged from the fistula, which shortly afterward healed up. The steer showed no symptoms of iodism during the entire treatment.

Post-mortem, November 29.—The bony swelling was spongy, but contained no pus and only a few centers of soft tissue. Two cords of white connective tissue extended from the contracted cicatrices on the surface toward the deeper parts. The lymph glands on the head were sound. No internal lesions. Carcass condemned.

No. 39989.

Red hornless steer, white star, white spot on right hip and left flank; received August 28.

The right side of the lower maxilla is enormously swollen. The deeper parts of the tumefaction are of a bony consistency, but are covered with a thick layer of fibrous tissue, which on the lower part is about three inches thick and is closely attached to the skin. At this place there is an ulcerating granuloma, 5 to 7 inches in diameter, protruding 3 to 4 inches over the thick swollen margins of the surrounding parts. (See picture of No. 545524.)

Treatment was commenced August 30 with a daily dose of 15 grams and was continued until October 20, with proper intervals. The steer showed a pronounced iodism and the granuloma dried up and shrunk rapidly. When the treatment was stopped there was only left a contracted scar, the fibrous parts of the swelling had shrunk considerably, and afterward continued to shrink.

Post-mortem, November 29.—The bony swelling is covered by a thin layer of fibrous tissue, which on the lower part contains a few centers of soft red tissue, ranging in size from a pea to a bean. The internal tissues of the bone are spongy, with several pockets filled with soft tissue, but none filled with pus. The surrounding lymph glands are all sound. No internal lesions. Carcass was condemned.

No. 43159.

Black steer, white star, hornless; received August 30 from Kansas City.

Immense fibrous bony swelling of left lower maxilla, with ulcerating granuloma 6 to 8 inches in diameter. (See No. 545525.)

Treatment was commenced September 1 with a daily dose of 15 grams and was continued until November 1, with proper intervals. Though the steer showed a pronounced iodism, the tumor showed no tendency to heal up or shrink; in fact, the large and frequent doses of medicine had very little effect on it. The granuloma remained unchanged in size and continued to discharge drops of pus through minute openings in the surface. The fibrous parts of the tumefaction shrunk almost entirely, making the granuloma appear about twice as large as it was originally.

Post-mortem, November 29.—An incision through the granuloma showed this to consist of very soft red tissue, with numerous pus foci, ranging in size from a pin head to a pea. The internal part of the bony swelling was spongy, containing numerous centers of soft red tissue, the largest being about the size of a walnut. The lymph glands on the head were sound. No internal lesion. Carcass was condemned.

No. 130988.

Red steer, hornless, white spot on right shoulder; received September 5, 1892.

In sublingual space on left side is located a fibrous tumor the size of a cocoanut. The tumor was slightly fluctuating, and was opened with a knife. It inclosed a deeply situated abscess, which contained from 1 to 3 ounces of good yellow pus.

Treatment was commenced September 7 with a daily dose of 12 grams, and was continued until October 10, by which time the tumor had disappeared, and only leaving a fibrous thickening in the skin. About October 20 the steer was considered cured.

Post-mortem, November 29.—No traces of the tumor left, except a slight induration of the skin. In the upper part of the right lung was located a tumor the size of a clinched fist. In the left lung in the same place was a tumor the size of a walnut. Both tumors consisted of fibrous tissue, and contained several cavities filled with pus and granulatous tissue. The microscopic examination proved them to be actinomycomas. The carcass was condemned.

No. 47067.

Red dehorned steer; received August 16.

On the left cheek are located seven hard fibrous tumors, ranging in size from a hazelnut to a walnut. They are situated in the short connective tissue under the skin, and can only be moved slightly. In the submaxillary space is located another one the size of a double clinched fist.

Treatment was commenced August 18, with a daily dose of 10 grams, and was continued until October 1 with proper intervals. By this time the small tumors in the cheek had disappeared, each leaving a small fibrous thickening in the skin. The tumor underneath had shrunk to the size of a hen's egg. About October 20 the steer was considered cured.

Post-mortem, November 29.—No traces of the tumors left, except a slight induration in the skin under the throat. In the upper part of the left lung were found three tumors about the size of a walnut. In the right lung a similar one the size of a hazelnut. All of them contained soft granulatous tissue and pus. The microscopic examination proved the pus to contain actinomyces. The carcass was condemned.

No. 130916.

Red steer, white face, horns; received August 30 from Kansas City.

Immense fibrous bony swelling of left lower maxilla, with ulcerating granuloma 6 to 8 inches in diameter. (See No. 545524.)

Treatment was commenced September 1 with a daily dose of 12 grams, and was continued until October 25, with proper intervals. The steer showed symptoms of iodism. The granuloma shrunk considerably, but did not dry up. The fibrous parts of the swelling were reduced.

Post-mortem, November 29.—The surface of the external granuloma is ulcerated. An incision through it shows that it consists of soft red tissue, with numerous pus foci the size of small peas. The fibrous covering on the bony swelling contained traces of soft tissue. The internal parts of the bone were spongy, with a few centers of soft tissue the size of hazelnuts. In the wall of the small intestines were located a few small hard nodules, containing a green colored detritus mass, consisting mostly of lime salts. The microscopic examination proved them not to be actinomycotic lesions. No other lesions internally. Carcass was condemned.

No. 44007.

Red roan dehorned steer, white on left shoulder and brisket; received August 16.

Immense fibrous, bony swelling of right lower maxilla, with ulcerating granuloma 6 to 7 inches in diameter. (See No. 545524.)

Treatment was commenced August 18 with a daily dose of 12 grams and was continued until October 10, with proper intervals. The steer showed pronounced iodism. The granuloma dried up, but only shrunk a little. The fibrous parts of the swelling were reduced somewhat in size. Medicine was again administered from October 20 to November 1, by which time the granuloma had shrunk to the size of a hen's egg, and the fibrous parts had disappeared almost entirely.

Post-mortem, November 29.—The external granuloma, which is about the size of a walnut, is rather hard, having a dry surface. It contains no pus foci, but extends up into a cavity in the bony swelling the size of a goose egg. Under the peritoneal covering on the small intestines were located a few small hard nodules, containing a greenish detritus mass with considerable lime salts in it. No actinomyces was found by the microscopical examination. On the surface of the liver was located an abscess the size of a hazelnut, filled with yellow pus. This also was free from the actinomyces. The carcass was condemned.

No. 45902.

Red steer, dehorned; received September 5, 1892.

The right ramus of the lower maxilla below the first molar is swollen to the size of a double clinched fist. The skin covering it is thickened and indurated, being about 1 inch thick on the lower part.

The treatment was commenced September 7, with a daily dose of 12 grams, and was continued until November 1. The steer showed a pronounced iodism, but the tumor shrunk only very little.

Post-mortem, November 29.—The induration covering the bony swelling contains a few centers of soft granulomatous tissue the size of hazelnuts. The internal parts of the bone were a little spongy, but contained no pus cavities. No lesions in the lymphatic glands and no internal lesions. The carcass was condemned.

No. 48042.

Red steer, partly dehorned; received August 30 from Kansas City.

On the right side of the face, 1 inch below the eye, is located a bony hard swelling the size of a clinched fist. The skin that covers the swelling is thick and indurated.

Treatment was commenced September 1 with a daily dose of 12 grams and continued until October 30, with proper intervals. The tumor remained almost unchanged, only the induration in the skin becoming thinner.

Post-mortem, November 29.—The internal parts of the bony swelling were very spongy, with several pockets filled with soft granulomatous tissue, but without any pus. A cord of white connective tissue extended from the center of the swelling down to the socket of the third molar in the upper jaw, which was loose. The lymph glands on the head were all sound. No internal lesions. Carcass condemned.

No. 39978.

Dark red steer, horns; received August 28.

On the right side of the face a little below the eye there is a flat bony swelling as large as the palm of a hand, and protruding about one inch. The skin covering the swelling is a little indurated. In the submaxillary space is located a hard fibrous tumor the size of a double clinched fist lying loose in the connective tissue under the skin.

Treatment was commenced August 30 with a daily dose of 10 grams, and was continued until October 15 with proper intervals. The bony swelling remained unchanged, while the tumor in submaxillary space completely disappeared.

Post-mortem, November 29.—The bony swelling contained a few centers with soft tissue, but no pus. No traces of the other tumor left. Lymph glands on head sound. In the left lung was a fibrous induration the size of a hen's egg, containing several small pockets filled with pus and soft tissue. Microscopical examination proved them to be actinomycomas. Carcass was condemned.

No. 48510.

Red steer, hornless, white star; received September 5.

Immense bony swelling of lower maxilla on right side with large ulcerating granuloma on lower end. Case similar to No. 48087.

Treatment was commenced September 7 with a daily dose of 15 grams and was continued until November 1 with proper intervals. The granuloma dried up and disappeared altogether, only leaving a large contracted cicatrix. The thick indurations which covered the bony swelling were reduced to a thin layer of connective tissue half an inch thick.

Post-mortem, November 29.—An incision through the bony part of the swelling shows this to be spongy. In the lower part of it, just inside the scar left by the granuloma, there was a large sinus the size of a hen's egg, and filled with the characteristic soft red tissue with the small yellow spots in. No pus could be squeezed out of the cut surface. The rest of the swelling contained neither pus nor soft tissue. No internal lesions. Lymph glands on head sound. Carcass was condemned.

No. 48155.

Black steer, hornless, spotted, white star; received August 30 from Kansas City.

All the left side of the face from the eye down to the nose is immensely swollen. The swelling is hard as bone and the covering skin is thick and indurated. Two or three fistulas open out on the surface, discharging yellow pus containing actinomycetes.

Treatment was commenced September 1 with a daily dose of 15 grams, and was continued until October 20 with proper intervals. By this time the tumor had shrunk to its capacity the fistulas had healed up, each leaving a small contracted scar which remained closed until the steer was killed six weeks later.

Post-mortem, November 29.—The skin is closely attached to the bony swelling. An incision through the bony swelling shows the internal tissue spongy, but containing neither pus nor soft tissue. The lymph glands on the head were sound and no internal lesions found. The carcass was condemned.

No. 39972.

Red steer, horns, received August 28, 1892; symptoms and treatment exactly like above number (48155).

Post-mortem, November 29.—The internal spongy part of the bony swelling contained a pocket the size of a robin's egg filled with pus. In the fibrous covering of the bone there were a few centers of soft tissue the size of beans. Lymph glands on head sound. No internal lesions. Carcass condemned.

No. 39953.

Roan steer, horns; received August 28.—On the right side of the face, 2 inches below the eye there is a hard bony swelling the size of a goose egg. In the loose connective tissue in the submaxillary space is located a hard fibrous tumor as large as a clinched fist.

Treatment was commenced August 30 with a daily dose of 10 grams, and was continued until October 7, with proper intervals. By this time the tumor in the sub-

maxillary space had completely disappeared, while the bony swelling remained almost unchanged.

Post-mortem, November 29.—No traces of the fibrous tumor left. Surrounding lymph glands all sound. An incision through the bony swelling proved it to be spongy with numerous centers of soft tissue. No internal lesions. Carcass was condemned.

No. 39955.

White steer, rudiments of horns; received August 28.

Large fibrous, bony swelling of left lower jaw, with ulcerating granuloma 4 to 5 inches in diameter. (See No. 545524.) On the right side of the face a couple of inches below the eye there is a small, flat, bony swelling.

Treatment was commenced August 30 with a daily dose of 12 grams and was continued until October 25, with proper intervals. The fibrous part of the tumefaction shrunk almost entirely and the granuloma dried up and disappeared, leaving a contracted scar not larger than a silver dollar. The steer showed pronounced iodism.

Post-mortem, November 29.—No traces of actino in the thin fibrous cover of the bony swelling. This one, however, contained several cavities filled with soft tissue and pus. The small bony swelling on the upper jaw was solid and contained no traces of the disease. The lymph glands on the head were sound. No internal lesions. Carcass was condemned.

No. 531593.

Spotted brown steer, dehorned, white star; received August 22.

Immense fibrous bony swelling of left lower maxilla, with ulcerating granuloma, 5 to 7 inches in diameter. (Case similar to No. 545524.)

Treatment was commenced August 24, with a daily dose of 12 grams, and was continued until October 25, with proper intervals. The steer showed plain symptoms of iodism, and the fibrous parts of the tumor shrunk considerably. The granuloma did not dry up, but a piece of it, about one-third, was expelled by the shrinking of the fibrous surroundings. Medicine was again administered for two weeks, but without any noticeable improvement.

Post-mortem, November 29.—The thick induration in the skin on the bony swelling contained several centers of soft tissue the size of hazelnuts. The bony part of the swelling was spongy, with numerous pockets, filled with pus and soft tissue. The inside of the right lower maxilla was slightly affected in the same way. The lymph glands on the head were sound. No internal lesions. Carcass condemned.

No. 545543.

Red steer, hornless; received August 16.

Immense fibrous bony swelling of right lower maxilla, with ulcerating granuloma 5 to 6 inches in diameter. (Case similar to No. 545524.)

Treatment was commenced August 18, with a daily dose of 12 grams, and was continued until October 25, with proper intervals. By this time the granuloma had dried up and disappeared, leaving a white contracted cicatrix. The fibrous parts of the swelling had also shrunk considerably. The steer showed pronounced iodism.

Post-mortem, November 29.—The bony swelling is covered by a thin layer of fibrous tissue. The internal tissue of the bone is spongy, with one large cavity the size of a clinched fist filled with soft tissue which, on the lower part, is covered by the scar left from the external granuloma. No pus can be squeezed out of the cut surface. The lymph glands on the head were all sound. No internal lesions. Carcass was condemned.

No. 45591.

Red steer, rudiments of horns; received August 30 from Kansas City.

Swelling of facial bones, left side from eye to nose, with ulcer size of the palm of a hand (see No. 130915).

Treatment was commenced September 1 with a daily dose of 12 grams and was continued until October 25 with proper intervals. The steer showed pronounced iodism. The ulcer dried up, only leaving a small cicatrix. The fibrous parts of the swelling shrunk almost completely, leaving the bony part covered by the slightly indurated skin.

Post-mortem, November 29.—The bony swelling was spongy and contained several centers of soft tissue, but no pus. The lymph glands on head were sound. Small actinomycotic tumor in the lung. Carcass was condemned.

No. 39951.

Red steer, large horns, white stripe across forehead; received August 28, 1892.

Immense fibrous bony swelling of right lower maxilla. (See No. 545524.) Ulcerating granuloma, 4 to 5 inches in diameter.

Treatment was commenced August 30 with a daily dose of 15 grams and was continued until October 25 with proper intervals. The steer showed pronounced iodism, and the fibrous parts of the tumor shrunk considerable. The granuloma dried up and shrunk to the size of a walnut.

Post-mortem, November 29.—The fibrous part of the swelling contained several centers of soft tissue, especially in the lower part around the scar left from the granuloma. The remaining part of this was rather hard and dry. The internal tissue of the bone was spongy with a few centers of soft tissue and pockets filled with pus. Just inside the granuloma was a large cavity filled with soft tissue. The lymph glands on head were sound. No internal lesions. Carcass condemned.

No. 39981.

Speckled steer, dehorned; received August 28.

Immense fibrous bony swelling of right lower jaw, with ulcerating granuloma. (Case similar to No. 545524.)

Treatment was commenced August 30, with a daily dose of 15 grams, and was continued until November 1 with proper intervals. Though the steer showed a fair degree of iodism, the effect of the medicine on the tumefaction was scarcely noticeable. The granuloma only dried up around the edges, but continued to ulcerate in the central part of the surface, with a very fetid odor. The surrounding fibrous swelling shrunk somewhat, which made the granuloma appear more prominent than it did originally. In spite of the large and frequent doses of medicine no further improvement was obtained.

Post-mortem, November 29.—The head had been removed by the butchers before examination. No internal lesions. Carcass was condemned.

No. 39966.

Light red steer, hornless; received August 28.

On the right lower maxilla, below the third molar, is located a hard bony swelling the size of a goose egg. The skin covering the swelling is thick and indurated, and closely attached to the underlying tissue.

Treatment was commenced August 30, with a daily dose of 10 grams, and was continued until October 15 with proper intervals. The first two weeks the swelling increased considerably in size, and became a trifle larger than a clinched fist. The dose was then increased to 12 grams, and later on to 15 grams, but in spite of this the

steer, which weighed about 1,100 pounds only showed obscure symptoms of iodism. The growth of the tumor was checked, but it did not shrink any.

Post-mortem, November 29.—The head of the steer had been removed by the butchers before it was examined. No internal lesions. Carcass condemned.

No. 59805.

Brindle steer, horns; received August 30, from Kansas City.

Extensive swelling of facial bones on right side. (Cases similar to No. 130915, but without granuloma).

Treatment was commenced September 1, with a daily dose of 15 grams, and was continued until November 1, with proper intervals. Steer showed a pronounced iodism, but the tumor only shrunk very little.

Post-mortem, November 29.—The skin covering the bony swelling was thick and indurated. The internal tissue of the tumefaction spongy with numerous centers of soft tissue and pockets filled with pus. Lymph glands on head sound. No internal lesions. Carcass condemned.

No. 39959.

Red steer, hornless, brindle head and neck; received August 28.

Immense fibrous bony swelling of left lower jaw. Ulcerating granuloma 6 to 7 inches in diameter, and 2 to 3 inches thick. (Case similar to No. 545524.)

Treatment was commenced August 30 with a daily dose of 15 grams, and was continued until October 25, with proper intervals. The steer showed a pronounced iodism. The fibrous part of the tumor shrunk almost entirely. Granuloma dried up and was drawn in. By November 12 it had disappeared, only leaving a large white contracted cicatrix.

Post-mortem, November 29.—The fibrous parts of the swelling around the cicatrix contained a few centers of soft tissue the size of hazel nuts. The bony swelling was spongy with a few pockets containing yellow inodorous pus. Surrounding lymph glands were sound. No internal lesions. The carcass was condemned.

No. 48043.

Red steer, white star, hornless; received August 30, from Kansas City.

Bony swelling of the left side of the face, from the eye to the nose. (Case similar to No. 130915.)

Treatment was commenced September 1, with a daily dose of 12 grams, and was continued until October 25th, with proper intervals. The steer showed the usual symptoms of iodism. The tumor remained unchanged in size, only the thick indurated skin covering it became a trifle thinner.

Post-mortem November 29.—No traces of actino in the indurated skin. The internal tissue of the bony swelling was spongy, and contained a few centers of soft tissue the size of hazel nuts. The lymph glands on the head were sound. No internal lesions. Carcass was condemned.

No. 45887.

Red steer, hornless, white star; received September 5.

Immense fibrous bony swelling of left lower maxilla, with ulcerating granuloma 6 to 7 inches in diameter. (See 545524.)

Treatment was commenced September 7 with a daily dose of 12 grams, and was continued until October 25 with proper intervals. The steer showed a pronounced iodism and the granuloma soon began to dry up and shrink, and finally disappeared entirely. The thick fibrous induration in the skin was reduced considerably.

Post-mortem, November 29.—The fibrous tissue on the lower part of the tumefaction inclosed a few small centers of soft tissue. The internal parts of the bony swelling were spongy, with several pockets and centers of pus and soft tissue. One of these just inside the scar left by the external granuloma was the size of a hen's egg. The lymph glands on the head were sound. No internal lesions. Carcass was condemned.

No. 545544.

Dark red steer, white face and rump; received August 16.

Large fibrous bony swelling on left lower maxilla with ulcerating granuloma 4 to 5 inches in diameter. (See No. 545524.)

Treatment was commenced August 18, with a daily dose of 12 grams, and was continued until October 1 with proper intervals. The steer showed no symptoms of iodism and the tumor improved only slowly. The granuloma dried up and shrunk slightly, and so did the fibrous parts of the tumefaction. Medicine was again administered from October 15 to October 30, by which time the granuloma had disappeared and the swelling had been reduced considerably.

Post-mortem, November 29.—The internal parts of the swelling were spongy and contained several cavities filled with soft tissue, one of which, just inside the cicatrix left by the external granuloma, was the size of a walnut. The lymph glands on the head were sound. No internal lesions. Carcass condemned.

No. 39983.

Red steer, white star, hornless, white spot on shoulder; received August 28, 1892.

Large fibrous bony swelling of right lower maxilla with ulcerating granuloma 4 to 5 inches in diameter. (See 545524.)

Treatment was commenced August 30 with a daily dose of 12 grams and was continued until October 25, with proper intervals. The steer showed a pronounced iodism, the granuloma dried up and disappeared, and the fibrous part of the swelling was reduced considerably.

Post-mortem, November 29.—The dense fibrous tissue surrounding the scar left by the granuloma contained a few centers of soft tissue, the internal tissues of the bony swelling were spongy with several pockets filled with soft tissue, one of them corresponding to the cicatrix, being the size of a hen's egg. No internal lesions. Carcass was condemned.

No. 131026.

Light roan steer, horns; received September 5.

No. 131030.

Speckled steer, red head and neck; received September 5.

Large, fibrous, bony swelling of right lower maxilla with ulcerating granuloma 2 to 3 inches in diameter. Treatment was commenced September 7 with a daily dose of 12 grams, and was continued until October 28, with proper intervals. Both steers showed a pronounced iodism. The granuloma dried up and disappeared, and the fibrous parts shrunk considerably.

Post-mortem November 29.—No. 131026. The fibrous covering on the bony swelling showed no traces of actinomycosis. The internal tissue of the bone was spongy, and contained only a few small centers filled with soft tissue. The lymph glands on the head were sound. No internal lesions. As the steer was in a very poor condition the carcass was condemned.

No. 131030. The fibrous part of the swelling contained several centers of soft tissue. The internal parts of the bone were spongy, and contained several large pock-

ets with soft tissue, especially just inside the scar left by the external granuloma. No internal lesions. Carcass was condemned.

Though both steers showed exactly same external lesions, and received exactly the same treatment as to dose of medicine and length of time administered, and though they both apparently improved equally, the post-mortem examination showed that the medicine had had a much stronger effect on the internal parts of the tumefaction on the first one than on the other.

No. 130905.

Red speckled steer, horns; received August 30 from Kansas City.

Fibrous bony swelling of the left side of the face from eye to nose. (See No. 130915.)

Treatment commenced September 1 with a daily dose of 12 grams and was continued until October 25, with proper intervals.

The steer showed a pronounced iodism and the fibrous parts of the tumefaction shrunk considerably, leaving the bony swelling covered by the slightly indurated skin.

Post-mortem, November 29.—The thin fibrous covering of the bony swelling contained a few small centers of soft tissue. The internal tissue of the bone was spongy and contained several pockets filled with soft tissue and pus. The lymph glands on the head were sound. No internal lesions. Carcass was condemned.

No. 48089.

Red steer, hornless; received August 30 from Kansas City.

Immense swelling of the facial bones on right side from eye to nose. The covering skin is very thick and indurated. On the most prominent part, 3 inches below the eye, is located an ulcer, 4 to 5 inches in diameter. (Case similar to 130915.)

Treatment was commenced September 1 with a daily dose of 15 grams and was continued until October 25, with proper intervals. The steer showed a pronounced iodism and the fibrous parts of the swelling were reduced considerably, while the ulcer dried up and became covered with epidermis, leaving three small fistulous openings, which soon afterwards closed up.

Post-mortem, November 29.—Slight traces of soft tissue centers left in the indurated skin. The internal tissues of the bony swelling were spongy, but contained only a very few cavities, filled with soft tissue. The lymph glands on head were sound. No internal lesions. Carcass was condemned.

No. 545764.

Red steer, white star, small horns; received August 16, 1892.

The right lower maxilla is swollen from the mouth to the neck. The swelling is hard as bone near the mouth, while the posterior parts are soft.

Treatment was commenced August 18 with a daily dose of 10 grams, and was continued until September 12, when the soft parts of the swelling had disappeared, leaving a hard, bony tumor the size of a clinched fist on the lower edge of the under jaw near the chin.

The treatment was again commenced October 10 and continued until November 15, with proper intervals, but apparently without further improvement in the size of the tumor. The steer being in a rather poor condition was not killed with the first lot slaughtered on November 29.

Post-mortem, January 27, 1893.—In right lower maxilla is a bony swelling the size of a goose egg. A section through this shows it to consist of compact bone, which around the dental canal is spongy, and contained a little pus. The fifth molar was decayed. No internal lesions. Carcass passed as sound.

No. 130926.

White speckled cow, short horns; received September 12, 1892.

In the sublingual space, on the right side, is located a hard, fibrous tumor the size of a double clinched fist lying loose in the connective tissue under the skin.

Treatment was commenced September 14 with a daily dose of 10 grams, and was continued until October 20, when the tumor had shrunk to the size of a hen's egg.

Medicine was again administered from November 13 till January 25 with one dose twice a week, which removed the last traces of the tumor.

Post-mortem, January 27, 1893.—No traces of the tumor left. A few small hard nodules in the wall of the small intestines. Lungs and liver sound. Carcass passed as sound.

No. 545750.

White speckled steer, with horns; received August 16, 1892.

The right upper maxilla a little below the eye is swollen considerably. The covering layer of the swelling is fibrous, the deeper parts bony. In sublingual space is located a hard, fibrous tumor the size of a clinched fist.

Treatment was commenced August 18 with a daily dose of 10 grams, and was continued until October 2 at proper intervals. By this time the tumor in sublingual space had disappeared, while the other one had grown considerably smaller. From November 1 until January 25 medicine was given about twice a week, only reducing the swelling a little.

Post-mortem, January 27, 1893.—No traces of actino in the fibrous covering on the bony swelling. This, however, is completely filled with actinomycotic new formations which extend into the maxillary sinus, and from here into the nasal fossa, where it may be felt by inserting a finger through the nostril.

Pleuritic adhesions in right lung. Internal organs sound. Carcass condemned.

No. 48071.

Red-spotted steer, hornless; received August 30, 1892, from Kansas City.

In right parotid region is located a hard, fibrous tumor the size of a goose egg, and a similar one is seen in sublingual region on same side.

Treatment was commenced September 1, with a daily dose of 10 grams, and was continued until October 10, with proper intervals, by which time the steer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of the tumors left. A few small hard nodules in the wall of the small intestines. Anterior lobes of both lungs adherent to pericardium. Carcass passed as sound.

No. 480496.

Dark red steer, dehorned; received August 16, 1892.

On both cheeks are located four to five small hard tumors the size of walnuts, and in sublingual space one the size of a double clinched fist.

Treatment was commenced August 18 with a daily dose of 10 grams, and was continued until October 7, with proper intervals, by which time all the smaller tumors had disappeared and the largest one had shrunk to the size of a hen's egg. Medicine was again administered from November 1 to November 20, and soon afterwards the steer was cured.

Post-mortem, January 27, 1893.—No traces of the tumors left. A few small nodules in the wall of the small intestines. Other internal organs sound. Carcass passed as sound.

No. 6.

No tag. Dark red steer with horns, white belly, white spot on flank. The steer has been under treatment for the last three months, though not steadily. It had a fibrous tumor under the throat as big as a child's head. At the post-mortem examination on January 27, 1893, no traces of the disease were found, and the carcass was passed as sound.

No. 25875.

White steer, hornless; received September 12, 1892. In left parotid and sublaryngeal region is located a fibrous tumor the size of a child's head. The covering skin is connected with the tumor. Treatment was commenced September 14 with a daily dose of 12 grams, and was continued until October 20, when the tumor had shrunk to the size of a goose egg. From November 20 to January 25 medicine was again administered. The steer showed a pronounced iodism under the whole treatment. *Post-mortem, January 27, 1893.*—No traces of the tumor left, except a fibrous induration in the skin where the tumor had been located. No internal lesions. Carcass passed as sound.

No. 59137.

Red Hereford steer, white head and shoulder; received August 28, 1892. In left parotid region are located two tumors, the size of a hen's egg. Under the throat, a similar one, the size of a double-clinched fist. Treatment was commenced August 30, with a daily dose of 12 grams, and was continued until October 25, when all three tumors disappeared, with the exception of a little induration in the skin. *Post-mortem, January 27, 1893.*—Submaxillary glands a little swollen, but sound. The skin in parotid region and under the throat fibrous and indurated. No internal lesions. Carcass passed as sound.

No. 45957.

Red steer, white breast and back; received September 5, 1892. In sublaryngeal space on right side is located a fibrous tumor, the size of a child's head. Treatment was commenced September 7, with a daily dose of 12 grams, and was continued until October 10, with proper intervals. By this time an abscess had formed, which was opened, and four to five ounces of good yellow pus evacuated. The tumor had shrunk considerably in size. Medicine was again administered from November 15 till January 20. The steer showed pronounced iodism, and the tumor shrunk rapidly. *Post-mortem, January 27, 1893.*—No traces of the tumor left except a 1-inch thick fibrous induration in the skin. No internal lesions. Carcass passed as sound.

No. 130914.

Red steer, white face and belly, with horns; received August 30, from Kansas City. In sublaryngeal space is located a hard, fibrous tumor, the size of a child's head. Inside the lips are located several small granulomas. Treatment was commenced September 1, with a daily dose of 12 grams, and was continued until October 15, with proper intervals. The granulomas in the mouth disappeared after two week's treatment, and the tumor under the throat shrunk rap-

idly, the steer showing a pronounced iodism. Medicine was again administered from November 1 until November 20, when the steer was regarded as cured, though it was in a rather poor condition.

Post-mortem, January 27, 1893.—Postpharyngeal glands indurated. No internal lesions. Carcass passed as sound.

No. 535770.

Red steer, white forehead and jaws, hornless; received August 22, 1892.

In right parotid region, just below the ear, is located a fibrous tumor the size of a clinched fist. In sublingual space a similar tumor, the size of a child's head.

Treatment was commenced August 24, with a daily dose of 12 grams, and was continued until October 20, with proper intervals. By this time the tumor in parotid region had disappeared, and the other one shrunk to the size of a goose egg. Medicine was again administered from November 9 until January 10, when this tumor had almost disappeared.

Post-mortem, January 27, 1893.—No traces of the tumor left except a fibrous induration in the skin. No internal lesions. Carcass passed as sound.

No. 39995.

Roan steer, hornless; received August 28, 1892.

In sublingual region is located a hard, fibrous tumor the size of a coconut.

Treatment was commenced on August 30, with a daily dose of 12 grams, and continued until October 20. The steer showed no symptoms of iodism, and the tumor remained almost unchanged. Treatment was continued from November 10 until January 20, but the tumor only shrunk very little.

Post-mortem, January 27, 1893.—Under the throat is located a fibrous tumor, the size of a child's head, containing several large centers of soft tissue and pus. The lymph glands on head sound. In the wall of the small intestines were located a few small nodules. Carcass condemned.

No. 39969.

Strawberry roan steer, dehorned; received August 28, 1892.

In left sublingual space is located a fibrous tumor the size of a double clinched fist, and on the middle of the left cheek is a similar one the size of a goose egg.

Treatment was commenced August 30, with a daily dose of 10 grams, and was continued until October 15, with proper intervals. By this time the tumor on the cheek had almost disappeared, and the other one grown considerably smaller. Medicine was again administered from November 12 till January 15, when the steer was regarded as cured. The steer showed only slight symptoms of iodism.

Post-mortem, January 27, 1893.—No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 545511.

Light red steer, dehorned; received August 16, 1892.

In sublingual space, on left side, is located a tumor the size of a child's head. On the lower part of the tumor extends through the skin an ulcerating granuloma, the size of a hen's egg.

Treatment was commenced August 18, with a daily dose of 12 grams, and was continued until October 7, with proper intervals. The steer showed no symptoms of iodism, and the tumor shrunk only slowly, while the granuloma showed no inclination to dry up. From November 9 the treatment was again commenced, and this time with better effect. The dose was increased to 15 grams. The tumor shrunk

completely, and the granuloma dried up. January 5 the treatment was discontinued, and two weeks later the steer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of tumor left, except a white cicatrix in the skin. Left postpharyngeal lymph gland considerably swollen, containing several small pus centers. No internal lesions. Carcass passed as sound.

No. 130921.

Red steer, hornless; received September 5, 1892.

In right parotid region is located a fibrous tumor the size of a double-clinched fist, a similar one under the throat, the size of a child's head, and another in left parotid region, the size of a goose egg.

Treatment was commenced September 7, with a daily dose of 12 grams, and was continued until November 10, with proper intervals. The steer showed a pronounced iodism, and the tumors shrunk rapidly. When the treatment was discontinued, there only remained slight traces of the tumors, which disappeared soon afterwards.

Post-mortem, January 27, 1893.—No traces of tumors left. No internal lesions. Carcass passed as sound.

No. 39965.

Red steer, white face and stomach; received August 28, 1892.

In right parotid region is located a hard, fibrous tumor, the size of a double-clinched fist, lying loose in the connective tissue under the skin.

Treatment was commenced August 30, with a daily dose of 10 grams, and was continued until October 20, with proper intervals. By this time the tumor had almost disappeared, the steer showing a pronounced iodism. November 17 a new tumor began to form on the opposite side, and medicine was again administered until December 20, when the steer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 25564.

Dark red steer, horns; received September 12, 1892.

Under the throat on left side is located a hard, fibrous tumor the size of a big child's head, lying loose in the connective tissue under the skin.

Treatment was commenced September 14 with a daily dose of 12 grams and was continued until October 20. The steer showed only slight symptoms of iodism and the tumor shrank slowly. November 10 the tumor had the size of a clinched fist, and medicine was again administered until December 12, when only a small bunch was left under the skin, which disappeared soon afterwards.

Post-mortem, January 27, 1893.—No traces of the tumor left except a thick fibrous induration in the skin. No internal lesions. Carcass passed as sound.

No. 131004.

Dark-red steer, roan face, hornless; received September 5, 1892.

In sublingual space is located a tumor the size of a child's head. On the lower end of this there is a granuloma about 2 inches in diameter.

Treatment was commenced on September 7 with a daily dose of 12 grams and was continued until October 7, when the granuloma had dried up and the tumor shrunk to the size of a goose egg. November 5 the granuloma began to grow again, and medicine was administered until December 12, when the steer was regarded as cured. The animal showed a pronounced iodism under the treatment.

Post-mortem, January 27, 1893.—No traces of tumor left, except a white contracted cicatrix on the slightly indurated skin. No internal lesions. Carcass passed as sound.

No. 19.

No tag. Red steer, horns.

On post-mortem examination, January 27, 1893, there was found no trace of actinomycosis, except a fibrous induration in the skin under the throat.

No. 20.

No tag. Same as above.

Both carcasses passed as sound.

No. 534833.

Dark-red steer, white forehead, hornless; received August 16, 1892.

In left parotid region, just below the ear, is located a hard, fibrous tumor the size of a hen's egg, and below this one, in the sublaryngeal region, another the size of a child's head.

Treatment commenced August 18 with a daily dose of ten grams and was continued until October 23, with proper intervals. The steer showed a slight iodism, and when the treatment was stopped the smaller tumor had disappeared and the larger one shrunk to the size of a walnut, but covered by a very thick, fibrous induration in the skin. Medicine was therefore commenced again on November 10 and continued until December 20, with two doses per week. By this time the steer was regarded as cured.

Post-mortem, January 27, 1893.—The skin in the parotid region slightly indurated. No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 47933.

Red steer, hornless; received August 30 from Kansas City.

Flat, fibrous, bony swelling on left upper maxilla, with a granulating ulcer 3 inches in diameter.

Treatment was commenced September 1 with a daily dose of 12 grams and was continued until October 20, when the fibrous parts of the swelling had disappeared and the ulcer dried up, leaving only a small white cicatrix. November 10 this broke open again, and medicine was again administered for four weeks. The steer showed a pronounced iodism under the treatment.

Post-mortem, January 27, 1893.—The superior maxilla slightly swollen. The maxillary sinus contains a little granulosomatous tissue of a rather solid character, and not containing any pus. The lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 68000.

Red steer, white face, horns; received August 22, 1892.

In left parotid region, just below the ear, is located a hard, fibrous tumor the size of a double clinched fist. In submaxillary space is a similar one the size of a child's head.

Treatment was commenced August 24 with a daily dose of 12 grams and was continued until October 7, with proper intervals. By this time an abscess had formed in the tumor below the ear, which was opened, and a few ounces of pus evacuated, after which the tumor rapidly disappeared. As the steer got sore feet from standing on the hard floor, he was turned out, and not taken in again before October 25. By this time the tumor under the jaw had shrunk to the size of a hen's egg and medi-

cine was again administered two weeks. Shortly afterwards the steer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 39968.

Red steer, white star, hornless; received August 28, 1892.

In sublingual space on left side is located a fibrous tumor the size of a large child's head. The superior maxilla on same side is a little swollen.

Treatment was commenced on August 30 with a daily dose of 12 grams and was continued until October 28, with proper intervals. The steer showed only slight symptoms of iodism, but the tumor had by this time shrunk to the size of a goose egg, while the swelling on the upper jaw remained unchanged. From November 15 until December 29 medicine was again administered in doses, two or three times a week, and the remaining part of the tumor disappeared slowly.

Post-mortem, January 27, 1893.—The superior maxilla above the third molar slightly swollen. By opening the maxillary sinus is seen a bony new formation, the form and size of a cherry, extending from the socket of the molar up into the sinus. It contained granular tissue, but no pus. No traces left of the tumor under the jaw. No internal lesions. Carcass passed as sound.

No. 25.

No tag. Red steer, white star, horns.

Left lower maxilla swollen to the size of a double clinched fist.

At the post-mortem examination on January 27 the swelling proved to be spongy, filled with granular tissue and pus. In the wall of the small intestines were a few small nodules. The carcass was condemned.

No. 39968.

Black steer, white star, hornless; received August 28, 1892.

In left sublingual region is located a hard, fibrous tumor the size of a child's head.

Treatment was commenced on August 30 with a daily dose of 12 grams and was continued until October 15, with proper intervals. The steer showed a pronounced iodism, and the tumor shrunk until about one-third of its original size. From November 10 until January 15 medicine was given about twice a week, and the tumor disappeared completely.

Post-mortem, January 27, 1893.—No traces of the tumor left. A few small nodules in the wall of the small intestines. The carcass was passed as sound.

No. 39973.

Red speckled steer, horns; received August 28, 1892.

In left parotid and sublingual region is located a large, rather soft tumor the size of a cocoanut. On the left cheek there is a very hard, fibrous tumor the size of a hen's egg.

Treatment was commenced on August 30 with a daily dose of 12 grams and was continued until October 20, with proper intervals. The little, hard tumor on the cheek disappeared remarkably fast, in about two or three weeks, and the larger one also shrunk considerably, the steer showing a well-pronounced iodism. From December 5 until January 20 medicine was again administered and the tumor shrunk to the size of a hen's egg.

Post-mortem, January 27, 1893.—In left parotid region is found a fibrous induration the size of a hen's egg. It contained traces of soft tissue. No internal lesions. Carcass passed as sound.

No. 131017.

Dark red steer, horns, received September 5, 1892.

In sublaryngeal region, on the left side is located a hard, fibrous tumor, the size of a double clinched fist. On the lower end of it there is a white contracted scar, 3 to 4 inches in diameter.

Treatment was commenced September 7, with a daily dose of ten grams, and continued until October 20. The tumor shrunk to about half its original size, but the thick indurations in the skin did not improve very much. From December 5, to January 15, medicine was given every second day, and the tumor shrunk constantly but slowly.

Post-mortem, January 27, 1893.—The skin under the throat indurated and about 1 inch thick. No traces of the tumor left, no internal lesions. Carcass passed as sound.

No. 59146.

Red steer, white brisket, hornless; received August 28, 1892.

In sublaryngeal region on right side is located a fibrous tumor the size of a child's head.

Treatment was commenced August 30, with a daily dose of 12 grams, and was continued until October 15. The steer showed very little iodism, and the tumor only shrunk to about half the original size. From November 10 until January 15 medicine was given about every second day, the tumor going down slowly.

Post-mortem, January 27, 1893.—In connective tissue under the throat is located a fibrous tumor the size of a small hen's egg. It contains a few centers of soft tissue of a rather dense character. The left sublaryngeal lymph-gland swollen to about double its size, containing several small pus foci. A few small nodules in the wall of the small intestines. No other internal lesions. Carcass passed as sound.

No. 25886.

Red steer, white spot on each shoulder, horns; received September 12, 1892.

In sublaryngeal region, on right side, is located a hard, fibrous tumor the size of a cocoanut. From its lower surface depends a cylindrical granuloma, 3 inches thick, covered with thin epidermis, and 5 to 6 inches long.

Treatment was commenced on September 14, with a daily dose of 12 grams. The fibrous tumor shrunk very rapidly, but the granuloma remained almost unchanged. On November 20 the large fibrous tumor had disappeared completely, leaving the granuloma hanging loose from the skin, with no connection with the underlying tissue. It had by this time shrunk about 3 inches, and had the form and size of a goose egg, attached with the broad end to the skin, and was now of an almost fibrous character.

Post-mortem, January 27, 1893.—No notes taken about the granuloma, which has been left in the skin and overlooked. Lymph gland on head sound. No internal lesions. Carcass passed as sound.

No. 131033.

Red steer, white star, and spot on shoulder and hip, horns; received September 5, 1892.

In sublaryngeal space on right side, is located a tumor the size of a double clinched fist.

Treatment was commenced on September 7, with a dose of 10 grams, and was continued until October 15, when the tumor had disappeared. About October 25 the respiration became accompanied by a snoring sound. The breathing was extremely difficult, the steer's appetite failed, and it lost rapidly in flesh, and stood

with the head stretched forward, with staring eyes. Medicine was at once administered in doses of 15 grams a day, and with good success. In less than a week the respiration became almost normal, the steer regained its appetite, and soon picked up in flesh again. Above the pharynx could be felt a tumor the size of a goose egg. Medicine was then given in doses of 10 grams about every second day, and December 10th the steer was regarded as cured.

Post-mortem, January 27, 1893.—Right postpharyngeal lymph gland swollen to about three times its original size, containing a few small pus foci. No internal lesions. Carcass passed as sound.

No. 39982.

Roan steer, white brisket, hornless; received August 28, 1892.

In the loose connective tissue in the submaxillary space, are located four hard, fibrous tumors, the size of goose eggs. Two similar ones of the same size are located in the left parotid region.

Treatment was commenced on August 30, with a daily dose of 12 grams, and was continued until October 20. The steer showed no symptoms of iodism and the tumors had only shrunk a little. From November 12 the medicine was given again, and the tumors now improved faster. January 15, the steer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 33.

No tag, N. M. Spotted dehorned steer.

Post-mortem, January 27, 1893.—In the left parotid region was located a fibrous tumor the size of a double clinched fist. It was closely covered by the skin and contained several centers of soft granulosomatous tissue, out of which pus drops might be squeezed.

No internal lesions. Carcass condemned.

No. 39970.

Dark red steer, horns; received August 28, 1892.

In sublingual space, on right side, is located a fibrous tumor the size of a child's head, on the lower surface of which is located a granuloma 3 to 4 inches in diameter. In parotid region on same side there is a similar one, the size of a goose egg.

Treatment was commenced on August 30 with a daily dose of 12 grams and was continued until October 28, but with little success. The steer showed no symptoms of iodism, and the tumors remained almost unchanged, and the granuloma showed no tendency to dry up. Medicine was again administered from November 10 until January 15, but the tumors only shrunk to about half their original size and the granuloma became a little smaller.

Post-mortem, January 27, 1893.—In sublingual region is located a hard, fibrous tumor the size of a double clinched fist, containing numerous pockets and centers filled with soft granulosomatous tissue and pus. In parotid region a fibrous induration the size of a walnut. Lymph glands on head sound. No internal lesions. Carcass condemned.

No. 35.

No tag, N. M. Red dehorned steer, white star in forehead, stripes on shoulder, white belly.

Post-mortem, January 27, 1893.—In the sublingual region is located a fibrous induration the size of a clinched fist, containing a few centers of granulosomatous tissue, of a rather solid character, not containing pus. No internal lesions. Carcass passed as sound.

No. 39954.

Red steer, hornless; received August 28, 1892.

In left parotid region is located a hard, fibrous tumor the size of a clinched fist. It is open on the most prominent point and pus flows out. Under the throat, on the right side, is a similar tumor, the same size.

Treatment was commenced on August 30 with a daily dose of 10 grams, and was continued until October 20, when the steer was regarded as cured. The animal showed a pronounced iodism.

Post-mortem, January 27, 1893.—No traces of the tumor left. No internal lesions. Carcass passed as sound.

No. 39967.

Red steer, white star, white belly, hornless; received August 28, 1892.

In the submaxillary space are located five tumors, the largest the size of a goose egg, the smallest the size of a walnut.

Treatment was commenced on August 30, with a daily dose of 12 grams, and was continued until October 20, when the tumors had shrunk to half their original size.

From November 12 until December 30 medicine was given twice a week, and the tumors disappeared completely.

Post-mortem, January 27, 1893.—No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 39971.

Brindle steer, white forehead, horns; received August 28, 1892.

Left superior maxilla is slightly swollen and covered by an ulcer 3 inches in diameter.

Treatment was commenced on August 30, with a daily dose of 10 grams, and was continued until October 15 with proper intervals. By this time the ulcer had dried up, and only left a little contracted scar. From November 12 until January 15, medicine was given twice a week, apparently without further improvement.

Post-mortem, January 27, 1893.—The skin covering the upper maxilla a little indurated. The maxillary sinus contained an actinomycotic new formation the size of a hen's egg, but of a rather fibrous character, and not containing any pus. No internal lesions. Carcass passed as sound.

No. 40.

No tag. N. M. Red-roan, dehorned steer.

Post-mortem, January 27, 1893.—Left upper maxilla slightly swollen and covered with a layer of fibrous tissue. Small new formations in maxillary sinus. A few small nodules in wall of small intestines. Carcass passed as sound.

No. 39986.

Red steer, white face and back, hornless; received August 28, 1892.

In the intermaxillary space are located three hard, fibrous tumors the size of goose eggs.

Treatment was commenced August 30, and was continued until October 14, when all three tumors had disappeared. The steer showed a pronounced iodism and lost in condition under the treatment.

Post-mortem, January 27, 1893.—The skin covering the submaxillary space slightly indurated. Lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 25855.

Red-speckled steer, hornless; received September 12, 1892.

The sub and intermaxillary region is filled with an oblong fibrous tumor formation, closely attached to the covering skin.

Treatment was commenced September 14, with a daily dose of 12 grams, and was continued until October 25, when the swelling had almost disappeared. One of the sublingual glands could then be felt swollen to the size of a hen's egg. Medicine was given from November 10 to November 25, when the steer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of the swelling left. No internal lesions. Carcass passed as sound.

No. 45879.

Red steer, hornless, white shoulders and hips; received September 5, 1892.

In sublaryngeal region are located three distinct fibrous tumors in close connection, together the size of a cocoanut. On outside of the largest one is an ulcerating granuloma 3 inches in diameter.

Treatment was commenced on September 7 with a daily dose of 12 grams, and was continued until October 27. The steer only showed slight symptoms of iodism, but the tumors shrunk slowly, and the ulcer dried up. From November 12 until January 17 medicine was administered, and the tumors disappeared, only leaving the covering skin hard and indurated with a white contracted cicatrix thereon.

Post-mortem, January 27, 1893.—No traces of the tumors left except the induration in the skin. No internal lesions. Carcass passed as sound.

No. 44.

No tag. Red steer with white shoulders and belly.

Post-mortem, January 27, 1893.—In left parotid region is a fibrous tumor the size of a double clinched fist, almost entirely consisting of white fibrous tissue, with a few deposits of soft tissue. On the outside of it is located a dried-up granuloma, the size of a hen's egg.

The carcass was passed as sound.

No. 533794.

Red steer, white star, and white on hips; received August 22, 1892.

In left parotid region is located a hard, fibrous tumor the size of a clinched fist. From this extends a softer swelling filling the whole sublaryngeal space, ascending on the right side up into the parotid region toward the ear.

Treatment was commenced on August 24, with a daily dose of 12 grams, and was continued until October 12. By this time the soft swelling in the sublaryngeal space had almost disappeared, while the tumor on the left side still remained, though it had shrunk a little. From November 9 until December 20 medicine was given regularly, and from then until January 20 every second day. The tumor beneath the left ear did not disappear entirely.

Post-mortem, January 27, 1893.—In left parotid region is a fibrous tumor the size of a walnut, containing a small amount of pus. In the surrounding tissue were located a few small centers of soft tissue. In the walls of the small intestines were located a few small, hard nodules. The carcass was passed as sound.

No. 534105.

Dark-red steer, dehorned; received August 22, 1892.

In the submaxillary and sublaryngeal space is located an immense, soft, undulating tumefaction the size of a half-peck measure. On the right cheek, outside the third molar, is a hard, fibrous tumor the size of a clinched fist.

Treatment was commenced August 24 and continued until October 25, with a daily dose of 12 grams. The steer showed a pronounced iodism and the tumefaction improved fast. By this time the tumor on the cheek had almost disappeared, while the swelling underneath was not one-third its original size. From November 11 until January 20 the medicine was given two to three times a week, and the head of the steer almost regained its normal appearance.

Post-mortem, January 27, 1893.—In the sublingual space is a soft, fibrous induration containing a number of small fibrous nodules, varying in size from a pea to a bean, containing no pus, but a small amount of soft tissue. Lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 131033.

Brown steer, horns; received September 5, 1892.

In right parotid region is located a hard, fibrous tumor, the size of a double clinched fist.

Treatment was commenced on September 7, with a daily dose of 10 grams, and continued until October 25, with proper intervals. The steer showed a pronounced iodism and the tumor disappeared altogether.

Post-mortem, January 27, 1893.—No traces of the tumor left. Lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 45973.

Black steer, speckled back and breast, dehorned; received September 5, 1892.

In left parotid region is located a hard, fibrous tumor the size of a goose egg. A similar one the size of a child's head is located in the submaxillary space.

Treatment was commenced on September 7, with a daily dose of 12 grams, and continued until October 22. The steer showed a pronounced iodism, and the tumors shrunk fast. From November 9 until December 20 medicine was again administered, and both tumors disappeared completely.

Post-mortem, January 27, 1893.—No traces of the tumors left except a slight induration in the skin. Lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 45909.

Dark-red steer, white star and spot on shoulders, ears cut; received September 5, 1892.

In sublingual and submaxillary space is located a large, fibrous tumor, on the lower surface of which is located an ulcerating granuloma, 6 to 7 inches in diameter.

Treatment was commenced on September 7, with a daily dose of 12 grams, and continued until October 20. The steer showed a pronounced iodism, and the fibrous parts of the tumor shrunk and contracted so fast that a large piece of the granuloma was expelled, and the rest dried up and disappeared, leaving a white contracted scar. Medicine was again administered from November 10 until January 20, when the tumefaction had disappeared, only leaving the skin hard and indurated.

Post-mortem, January 27, 1893.—No traces of the tumor left, except a fibrous induration in the skin showing traces of soft tissue. No internal lesions. Carcass passed as sound.

No. 40733.

Brown bull, horns; received August 30, 1892, from Kansas City.

In the submaxillary space on the right side is located a hard, fibrous tumor the size of a child's head. On the right cheek is a similar one the size of a goose egg.

Treatment was commenced September 1 by a daily dose of 12 grams, and continued until December 25, with proper intervals. The steer showed a pronounced iodism, and the tumor on the cheek disappeared fast, while the larger one shrunk considerably. From November 10 until December 28 medicine was again administered, and the remaining tumor disappeared slowly, leaving the skin indurated.

Post-mortem, January 27, 1893.—No traces of the tumors left. Lymph glands on head sound. In the wall of the small intestines were found located a few small, hard nodules. Carcass passed as sound.

No. 131063.

Black steer, horns, ears cut; received September 5, 1892.

In sublaryngeal space is located a hard, fibrous tumor the size of a child's head.

Treatment was commenced on September 7, with a daily dose of 10 grams, and continued until October 22, when the tumor had almost disappeared. The steer showed a pronounced iodism.

Post-mortem, January 27, 1893.—No traces of the tumor left, except a fibrous induration in the skin. Lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 45932.

Roan bull, hornless; received September 5, 1892.

In the loose connective tissue under the skin covering the sublaryngeal region on the left side is located a tumor the size of a double clinched fist. It is hard and fibrous, with a smooth surface. On the lower end there is a scar, and here the skin is in close connection with the tumor.

The treatment was commenced September 6 by giving a dose of 15 grams iodide of potassium daily, with proper intervals of about one or two days a week. The medicine did not have any marked effect on the bull, which only showed vague symptoms of iodism, the tumor shrinking but slowly. At the end of the fourth week the treatment was stopped, the tumor having then shrunk to about one-third its original size. In less than three weeks the rest disappeared without any further treatment, leaving only a hard fibrous thickening in the skin, the size of the palm of a hand, which made it look as if there was still a tumor there, but by manipulation no traces of the original lump can be detected.

Post-mortem, January 27, 1893.—The skin covering the left parotid region a little indurated, and covered by a white scar. Lymph glands on head sound. On surface of liver a small nodule the size of a bean. Carcass passed as sound.

No. 53.

No tag; red hornless steer, white belly, white spot on left side.

Post-mortem, January 27, 1893.—No lesions of any kind found. Carcass passed as sound.

No. 39990.

Roan dehorned heifer; received August 28, 1892.

In the submaxillary space is located a hard, fibrous tumor the size of a large coconut.

Treatment was commenced August 30, with a daily dose of 10 grams, and was continued until October 25, with proper intervals. The heifer showed no symptoms of iodism, and the medicine had hardly any effect on the tumor. The treatment was continued from 9th of November until January 25, but without success. The tumor only shrunk a little.

Post-mortem, January 27, 1893.—In left side of the submaxillary space was located a hard, fibrous tumor the size of a child's head, containing several centers of soft granulomatous tissue and pus. No internal lesions. The carcass was condemned.

No. 531549.

Red steer, hornless; received August 22, 1892.

In the sublaryngeal space on the left side is located a hard, fibrous tumor the size of a double clinched fist.

Treatment was commenced on August 24, with a daily dose of 12 grams, and was continued until October 15, when the tumor had disappeared. The steer showed a pronounced iodism.

Post-mortem, January 27, 1893.—No traces of the tumor left. No internal lesions. The carcass was passed as sound.

No. 45930.

Red bull, hornless; received September 5, 1892.

In sublaryngeal space on left side is located a hard, fibrous tumor the size of a child's head, lying loose in the connective tissue under the skin.

Treatment was commenced on September 7, with a daily dose of 12 grams, and was continued until October 20, when the tumor had shrunk to the size of a clinched fist. From November 10 until December 20 medicine was again administered and the rest of the tumor disappeared.

Post-mortem, January 27, 1893.—No traces of the lump left. No internal lesions. Carcass was passed as sound.

No. 59131.

White steer, hornless; received August 30, 1892, from Kansas City.

The left upper maxilla is slightly swollen. In sublaryngeal space on left side is located a hard, fibrous tumor the size of a cocoanut.

Treatment was commenced September 1, with a daily dose of 12 grams, and was continued until October 20, when the soft tumor had almost disappeared, while the bony swelling remained the same. The treatment was continued from November 10 to January 20. The steer showed a pronounced iodism, and the tumor underneath disappeared completely.

Post-mortem, January 27, 1893.—The left upper maxilla is swollen slightly. The maxillary sinus was completely filled with actinomycotic new formations extending into the nasal fossa. The three first molars were pushed slightly outward. Lymph glands on head sound. No internal lesions. Carcass condemned.

No. 39962.

Red heifer, white belly; received August 28, 1892.

In left sublaryngeal space is located a tumor the size of a double clinched fist.

Treatment was commenced on August 30, with a daily dose of 10 grams and continued until October 10, when the heifer was cured.

Post-mortem, January 27, 1893.—No traces of the tumor left, no internal lesions. Carcass was passed as sound.

No. 40000.

Red cow, hornless; received August 22, 1892.

In left parotid region is located a large, rather soft tumor, extending from the ear down into the sublaryngeal region.

Treatment was commenced on August 24, with a daily dose of 10 grams and continued until October 27, when the whole tumor had disappeared, except a fibrous induration in the skin.

Post-mortem, January 27, 1893.—No traces of the tumor left except a fibrous induration in the skin. No internal lesions. Carcass passed as sound.

No. 45927.

Brindle steer, white star, hornless; received September 5, 1892.

In sublingual space is located a fibrous tumor the size of a cocoanut, and a similar one the size of a goose egg in the intermaxillary space.

Treatment was commenced on September 7, with a daily dose of 10 grams and continued until October 10. The steer showed a pronounced iodism, and the tumors shrunk considerably. From November 12 until December 20, medicine was again administered, and the tumors disappeared completely.

Post-mortem, January 27, 1893.—No traces of the tumors left except an induration in the skin. No internal lesions. Carcass was passed as sound.

No. 39996.

Red bull, dehorned; received August 28, 1892.

In sublingual space is located a fibrous tumor the size of a child's head. On the inside of the lips are located a few small granulomas.

Treatment was commenced on August 30, with a daily dose of 12 grams, and continued until October 25. The bull showed hardly any symptoms of iodism, and the tumor shrunk but slowly. The granulomas on the lips disappeared after two weeks' treatment. Medicine was given from November 10 until December 20, when most of the tumor had gone.

Post-mortem, January 27, 1893.—No traces of tumors left, except a fibrous induration in the skin. No internal lesions. The carcass was passed as sound.

No. 62.

No tag. Red steer, hornless, white face and neck.

Post-mortem, January 27, 1893.—No traces of actinomycosis found. The carcass was passed as sound.

No. 45918.

Speckled steer, red head and neck, hornless; received September 5, 1892.

In sublingual space is located a fibrous tumor the size of a cocoanut. On the lower surface is located an ulcer, from 5 to 6 inches in diameter.

Treatment was commenced September 7 with a daily dose of 12 grams and continued until October 20, with proper intervals. The steer showed a well-pronounced iodism, and the ulcer soon dried up and shrunk. From November 10 until January 20 medicine was again administered and the tumor disappeared entirely, leaving a hard, fibrous induration in the skin, covered by a white scar.

Post-mortem, January 27, 1893.—No traces of the tumor left, except the induration in the skin. In sublingual gland a granuloma the size of a walnut, not containing any pus. No internal lesions. Carcass passed as sound.

No. 64.

No tag. Black, dehorned steer.

Post-mortem, January 27, 1893.—In submaxillary space a fibrous induration 2 inches thick, showing traces of soft tissue. Lymph glands on head sound. No internal lesions. Carcass passed as sound.

No. 65.

No tag. Red steer, horns, white face.

Post-mortem, January 27, 1893.—On left lower maxilla was a bony tumor the size of a double clinched fist. The internal parts of the tumor were spongy, and contained numerous cavities filled with soft granulatous tissue and pus. No internal lesions. Carcass condemned.

No. 43140.

Red steer, white star, hornless; received August 30, 1892, from Kansas City.

In right upper maxilla is a fibrous enlargement the size of a clinched fist. On the most prominent point is located a small ulcer 1 to 2 inches in diameter.

Treatment was commenced on September 1, and continued until October 20, when the fibrous points of the tumor had shrunk and the ulcer dried up. The treatment was continued from November 10 until January 20, with doses twice a week.

Post-mortem, January 27, 1893.—The swelling on the right upper maxilla is covered by a thin layer of fibrous tissue, inclosing a few small centers of soft tissue containing pus. The maxillary sinus is completely filled by actinomycotic new formations, extending into the nasal fossa. Lymph glands on head sound. No internal lesions. Carcass condemned.

No. 44534.

Red steer, large horns; received September 12, 1892.

In right parotid region are located three tumors the size of goose eggs, a similar one the size of a cocoanut in sublaryngeal region, and two the size of goose eggs in left parotid region.

Treatment was commenced on September 14 with a daily dose of 12 grams, and continued until October 25. October 2 two abscesses were formed in right parotid region. The steer showed a pronounced iodism and all the tumors shrunk considerably.

From November 12 medicine was again administered, and the tumors disappeared, leaving only a fibrous induration in the skin.

Post-mortem, January 27, 1893.—No traces of tumors left. Lymph glands on head sound. Mesenteric glands swollen to the size of hen's eggs containing pus (probably not actinomycotic). Numerous small abscesses in both lungs. Carcass condemned.

No. 45963.

Red steer, white star and rump; dehorned; received September 5, 1892.

In left parotid region were located two tumors the size of hen's eggs. Three similar ones the size of goose eggs in intermaxillary space.

Treatment was commenced on September 7 with a daily dose of 10 grams, and continued until September 29, when the steer was almost cured. It showed a pronounced iodism.

Post-mortem, January 27, 1893.—No traces of tumors left. In liver an abscess the size of a hazelnut. Carcass passed as sound.

No. 69.

No tag. Speckled steer, horns.

Post-mortem, January 27, 1893.—All the left side of the face immensely swollen from the eye down to the nose. The bony swelling covered by a thin layer of fibrous tissue. The maxillary sinus is filled with granulatous tissue, and the bordering bones are rarefied. The actinomycotic new formations extend into the nasal fossa almost down to the nostril. The carcass was condemned.

No. 541268.

Strawberry roan steer, dehorned; received August 16, 1892.

On the right cheek are located three hard tumors the size of walnuts. In submaxillary space is a tumor the size of a child's head.

Treatment was commenced August 17, with a daily dose of 10 grams. On August 22, there appeared suddenly a granulomatous growth in the middle of the forehead, and another one behind the crest of the occiput. They were both round, 2 inches in diameter, red, and blood-filled, and looked like a large strawberry. The dose of medicine was increased to 12 grams a day, and in less than a week they had both completely disappeared. The treatment was continued until October 12, when all the tumors had disappeared.

Post-mortem, January 27, 1893.—No traces of tumors left. No internal lesions. Carcass passed as sound.

No. 45896.

Red steer, speckled side and back; received September 5, 1892.

In left parotid region and sublaryngeal space is located a rather soft tumor the size of a child's head.

Treatment was commenced on September 7 and continued until October 22, with a daily dose of 12 grams. The steer showed a pronounced iodism, and the tumor shrunk fast. From November 10 until December 15 medicine was again administered, and soon afterwards the tumor had disappeared completely.

Post-mortem, January 27, 1893.—No traces of tumor left. Sublingual lymph glands indurated and swollen to the size of a walnut, containing a few drops of pus. No internal lesions. Carcass passed as sound.

No. 45942.

Brown steer, hornless; received September 5, 1892.

In sublaryngeal region on left side is located a hard, fibrous tumor, the size of a large cocoanut. On lower surface there is an ulcerating granuloma 4 to 5 inches in diameter.

Treatment was commenced on September 7, with a daily dose of 12 grams, and continued until October 25. The steer showed hardly any symptoms of iodism, and the tumefaction only improved slowly. Medicine was again administered from November 10 until January 20, but the tumor only shrunk to about half the original size, and the granuloma grew a good deal smaller, without showing any tendency to dry up.

Post-mortem, January 27, 1893.—The parotid glands on both sides swollen and containing several pus-foci. In sublingual space is located a fibrous tumor, the size of a child's head, containing one big pus cavity, and several small centers of soft tissue and pus. In both lungs were numerous small abscesses.

The carcass was condemned.

No. 73.

No tag. Dark red steer, horns.

Post-mortem, January 27, 1893.—On right lower maxilla is a bony swelling the size of a clinched fist. The internal parts of the tumor were spongy, and contained a quantity of soft tissue and pus.

The carcass was condemned.

No. 74.

No tag. Dark red bull, horns.

Post-mortem, January 27, 1893.—In submaxillary space is a small fibrous induration in the skin. No traces of soft tissue. No internal lesions. Carcass passed as sound.

No. 76.

No tag. Red steer, hornless, white star, belly and flank.

Post-mortem, January 27, 1893.—On right lower maxilla is a bony enlargement the size of a hen's egg. The internal parts were rather compact and only spongy in the center, where a small amount of granulomatous tissue was present. No internal lesions. Carcass passed as sound.

No. 39956.

Speckled steer, hornless; received August 28, 1892.

In submaxillary space are located three hard fibrous tumors, the size of a goose egg, loose in connective tissue under the skin. On right cheek a similar one, the size of a hen's egg.

Treatment was commenced on August 30, with a daily dose of 12 grams, and continued until October 20. The steer showed a pronounced iodism, and the tumors disappeared completely.

Post-mortem, January 27, 1893.—Small fibrous indurations in the skin in submaxillary space. Large contracted scar on anterior surface of liver. Carcass passed as sound.

No. 77.

No tag. Spotted steer, horns.

Post-mortem, January 27, 1893.—On left lower maxilla is a bony tumor the size of a double clinched fist. It is covered by a thick layer of fibrous tissue, containing several centers of soft tissue. The internal parts of the tumor were spongy, the cavities filled with soft tissue and pus. No internal lesions. Carcass condemned.

No. 545789.

Red steer, speckled on head, brisket, belly, and legs; received August 16, 1892.

All the left side of the face from eye to nostril considerably swollen. Three inches below the eye is located an ulcer 4 to 5 inches in diameter. The swelling is hard and supposed to be bony in the deeper parts.

Treatment was commenced on August 18 with a daily dose of 10 grams, and continued until October 7, when the ulcer had healed up completely and the swelling had been reduced to the size of a goose egg. No more medicine was given until November 10, and the swelling improved slowly, and it was therefore concluded that it did not extend into the maxillary sinus. From November 10 until January 20 medicine was given about twice a week and the swelling shrunk so that it was hardly noticeable.

Post-mortem, January 27, 1893.—The left upper maxilla a little swollen, covered by a thin layer of fibrous tissue, not containing any soft tissue. The bone itself is a little rarefied, but the lesion does not extend into the sinus. The infection has probably taken place through some external abrasion in the skin. The lymph glands on head sound. No internal lesions. The carcass was passed as sound.

No. 59092.

Brindle heifer, white face and back, dehorned; received August 28, 1892.

In submaxillary space are located three fibrous tumors, the size from a child's head to a goose egg, closely connected with each other.

Treatment was commenced on August 30 with a daily dose of 10 grams and continued until October 25, when there only remained one tumor the size of a goose egg. The heifer showed a pronounced iodism. From November 10 until December 15 medicine was again administered, when the heifer was regarded as cured.

Post-mortem, January 27, 1893.—No traces of the tumors left. Lymph glands on head sound. No internal lesions except a cysticercus bovis in the liver. Carcass passed as sound.

No. 252388.

Red steer, white on left flank and belly, white forehead; received July 25, 1892.

Condition very poor. The left lower maxilla is immensely swollen from the angle of the jaw to the chin. The swelling extends up over the cheek towards the eye and is of a very dense, fibrous character, on some places almost bony. On the lower surface are located two ulcerating granulomas, one smaller, about 2 inches in diameter, and a larger one, 5 or 6 inches in diameter. The surface of the granulomas is raw, covered with pus crusts. In the parotid region on the same side are located two round, hard tumors, one just below the ear the size of a hen's egg, and below this another the size of a clinched fist. The deformation of the lower maxilla has interfered with the mastication in a considerable degree, so the steer is only able to eat soft or ground feed, but no hay. When not eating he is grinding his teeth and the saliva flows incessantly from his mouth. The steer is very weak, lies down almost all day, and looks as if he were not able to live until the next day. The excretion from the ulcers is exceedingly fetid.

Treatment.—From July 27 until August 1, 5 grams of iodide of potassium dissolved in 15 grams of water were injected into the jugular vein. It had to be stopped, as phlebitis resulted. The three following days the same amount was injected hypodermically on the neck, but this caused mortification of the tissue at the place of injection. Nevertheless, it had a good effect, and the granulomas began to dry up at the edge. From August 4 the medicine was given internally in doses of 10 grams daily, which was continued until October 25, when the steer was cured. The little granuloma had disappeared completely, while the large one had been reduced to a scar in the skin the size of a silver dollar. The fibrous swelling was reduced to a small induration in the skin on the cheek. The steer ate and drank all he was given, and became fat. The two tumors in the parotid region became fluctuating, were opened with a knife, and a few ounces of good pus evacuated, after which they disappeared completely. During the treatment the ulcers had been washed with a 2 per cent creolin solution to prevent the smell and dusted with equal parts of iodoform and boric acid. When they had dried up they were painted with tincture of iodide.

Post-mortem, January 27, 1893.—Under the skin of the left cheek is a small fibrous induration, and outside a white scar the size of a silver half dollar. Of the tumors in parotid region no traces are left. No internal lesions. Carcass passed as sound.

No. 159687.

Light red steer, dehorned; received July 25, 1892.

The right upper maxilla swollen to the size of a clinched fist. The swelling is bony and closely covered by the skin, and on the lower end of it is a small scar where the skin has been broken. On the inside of the upper lips are located two flat granulomas, one to two inches in diameter.

Treatment was commenced July 27 with a daily dose of 10 grams. The swelling began to grow right away, so it was evident that the maxillary sinus was filled with new formations. August 1, the scar on the point of the swelling broke open and a few drops of the pus were discharged. The tumor kept on growing until August 15, when it began to decrease. The scar healed up and about the middle of September the tumor had regained its original size. By this time the maxilla on the opposite side began to swell. It had from the beginning been slightly swollen, but so little that it was hardly noticeable. In spite of increased and frequent doses of medicine, it increased rapidly in size. This is the only case where the medicine did not at least stop the progress of the disease. The treatment was continued until the ani-

mal was killed, by which time the tumor on the right side had its original size, and the one on the left side was about the size of a small hen's egg. An external treatment with unguentum iodi had no effect.

Post-mortem, January 27, 1893.—The maxillary sinus on both sides filled with actinomycotic new formations. The bony swelling is on the outside covered by a thin layer of fibrous tissue containing a few centers of soft tissue. No internal lesions. The carcass was condemned.

No. 252388.

Red steer, white on left flank and belly, white forehead; received July 25, 1892.

The left lower maxilla is immensely swollen from the chin to the angle of the jaw. The swelling is of a fibrous character, but seems to be bony in the deeper parts. The surface is covered by two ulcerating granulomas, the smaller one $1\frac{1}{4}$ inches in diameter, and the larger one almost circular, 5 to 6 inches in diameter. The granulomas are partly covered with dried pus, and are partly raw and bleeding. In the parotid region on the same side is located two tumors, one just below the ear and the size of a hen's egg, and below this another the size of a clinched fist. Both of these tumors were slightly fluctuating. The deformation of the lower maxilla has interfered considerably with the mastication, so the steer is only able to eat soft or ground feed, but no hay. When not eating he is constantly grinding his teeth, and the saliva flows incessantly from his mouth. The steer is in very poor condition, lies down most of the time, and looks as if he had not many more days to live.

The treatment was commenced July 27 with a dose of 10 grams of iodide of potassium. The three following days a solution of 5 grams of iodide of potassium in 15 grams of distilled water was injected into the jugular vein, but had to be stopped, as there resulted phlebitis. The same treatment was then tried hypodermically, the solution being made a little weaker (1-4), but this resulted in a necrosis of the tissue at the place of injection. The treatment was therefore continued by giving the medicine internally until the 1st of September. The steer showed pronounced iodism, the granulomas dried up and shrunk, and the whole tumefaction was reduced to less than one-third its original size. The ulcers, which in the beginning were exceedingly fetid, were washed in a 2-per cent solution of creolin and dusted with iodoform and boracic acid, equal parts. The two tumors in the parotid region had been opened with a knife and a small amount of pus evacuated. From September 15 till October 15 medicine was again administered and the tumor on the jaw was reduced to a small fibrous induration in the skin, covered by a pink cicatrix, the size of a silver dollar. The two tumors in the parotid region disappeared completely. The lesion did not extend into the bony tissues of the lower maxilla as was at first supposed. About November 1 the steer was regarded as cured and was in splendid condition.

Post-mortem, January 29, 1893.—On the left cheek and in left parotid region is a slight fibrous induration of the skin. No traces of soft tissue left. No internal lesions. Carcass passed as sound.

No. 159687.

Light red steer, hornless; white forehead, white marks on belly, flank, and legs; received July 25, 1892.

On the right upper maxilla is located a swelling the size of a large goose egg, about 5 inches long and $3\frac{1}{4}$ inches wide. The swelling is bony, hard, and closely covered by the skin. On the lower end of it is located a small scar, where the skin has been broken, but now is healed up. The left upper maxilla is slightly swollen, hardly noticeable. On the inside of the upper lip is located two small flat actinomycomas $1\frac{1}{2}$ to 2 inches in diameter. The steer is in fairly good condition.

The treatment was commenced July 27, 1892, with a daily dose of 10 grams. August 1 the swelling had apparently increased a little, and the scar on the lower

end broke open and a few drops of pus was discharged. For the first two weeks the tumor increased in size slowly, in spite of the increase in the dose to 12 to 15 grams a day. Then it commenced to shrink again, until it had reached the original size. About September 1 the upper maxilla on the left side began to swell, regardless of the large doses of medicine. This is the only case out of 192 animals affected with actinomycosis where the medicine did not at least arrest the progress of the disease, but the steer showed a perfect insusceptibility to the effect of the treatment. The administration of medicine was continued with proper intervals until the steer was slaughtered, by which time both tumors were about the same size, the one on the right side a little larger than originally. The two granulomas inside the upper lip disappeared after three to four weeks' treatment. An external application of iodine ointment to the tumors had no effect.

Post-mortem, January 29, 1893.—The maxillary sinuses on both sides completely filled with soft actinomycotic new formations, extending into the nasal fossa. Infection has evidently taken place through the dental alveola of the third molar on both sides, as they were pushed slightly out of their places. The lymph glands on the head were sound. No internal lesions. Carcass condemned.

No. 396938.

Red steer, white forehead, rudiments of horns; received July 30, 1892.

In the sublingual region is located a hard, fibrous tumor, the size of a double clinched fist, lying loose in the connective tissue under the skin. From the lower surface of the tumor projects a round, red granuloma about 4 inches in diameter.

Treatment was commenced August 1 with a daily dose of 12 grams and was continued until January 20, 1893. The steer showed no symptoms of iodism and the tumor improved only slowly. About October 1 the tumor had shrunk to half its original size and the granuloma had dried up and shrunk to the size of a silver dollar. By this time an abscess formed in the left parotid region just below the ear, which broke open, and a small amount of pus was evacuated. The tumor kept on shrinking slowly and had almost disappeared when the animal was slaughtered.

Post-mortem, January 29, 1893.—In the sublingual region is a fibrous induration in the skin about 1 inch thick, on the outside of which is located a white contracted cicatrix. In the left parotid region is a small induration in the skin. The lymph glands on the head were sound. In the upper part of the left lung was located an actinomycotic tumor the size of a child's head. The carcass was condemned.

No. 373406.

Red stag, horns; received July 30, 1892.

In the right parotid region is located a flat, hard, fibrous tumor, the size of the palm of the hand. It is closely connected with the covering skin. In the center of the swelling is an open scar, out of which flow a few drops of yellow pus. In the sublingual space, on the right side, is located a hard, fibrous tumor, the size of a goose egg, lying loose in the connective tissue under the skin. On the lower end of it is a small scar where it has been broken, and here the skin is in close connection with the tumor. On the middle of the right cheek, outside the third molar, is located a red granuloma the size of a silver half dollar. The surface is ulcerating and covered with pus crusts. The surrounding skin is hard and indurated. On the inside of the upper lip is located a small oblong granuloma one inch long and half an inch wide.

Treatment was commenced August 1 with a daily dose of fifteen grams and was continued until October 15, with proper intervals. The stag showed a pronounced iodism and the tumors improved rapidly. The granuloma in the mouth disappeared after two weeks' treatment. The one on the cheek dried up and disappeared after four weeks' treatment, and the hard swelling in the parotid region became soft and

disappeared. From November 1 until November 15 medicine was again administered, and shortly afterwards the stag was regarded as cured.

Post-mortem, January 29, 1893.—No traces of the tumors left. No internal lesions. Carcass passed as sound.

No. 294924.

White steer, horns; received July 30, 1892.

In the sublaryngeal space on the right side is located a hard, fibrous tumor, the size of a double clinched fist, lying loose in the connective tissue under the skin.

On the left shoulder is located a red, soft granuloma the size of a large hen's egg. The surrounding skin is thick and indurated, but is not connected with the underlying tissue.

Treatment was commenced August 1 with a daily dose of 10 grams and was continued until September 12, when the tumor in the sublaryngeal space had disappeared and the granuloma on the shoulder had shrunk to the size of a hazelnut. From September 20 to September 30 medicine was again administered and the steer was regarded as cured.

Post-mortem, January 29, 1893.—No traces of the tumors left; no internal lesions. Carcass passed as sound.

No. 322415.

Dark-red steer, horns; received July 25, 1892.

Both the lower maxillas, especially the left one, are immensely swollen from the chin to the neck. The swelling extends up over the left side of the face toward the eye. On the lower surface is located an ulcerating granuloma, 6 inches in diameter, and protruding 4 to 5 inches over the swollen edges of the surrounding tissue. The whole tumefaction is the size of a half-peck measure. The teeth in the left lower maxilla are pushed out of their sockets, so that mastication is considerably impaired.

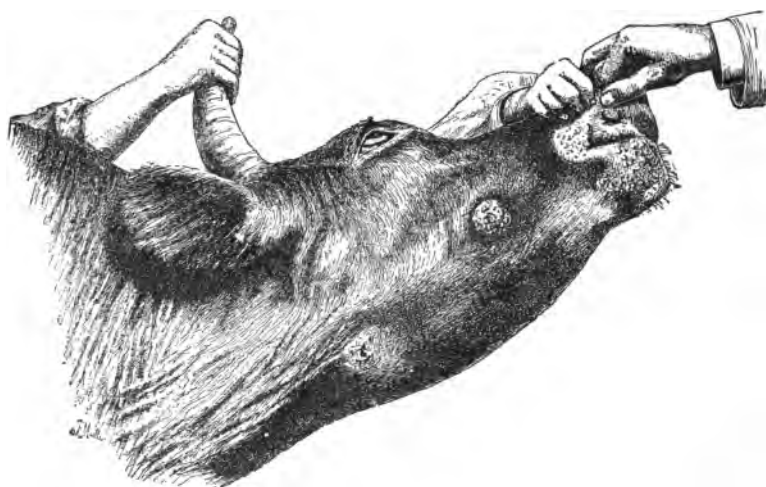
Treatment was commenced July 27 with a daily dose of 10 grams and was continued until January 25, 1893, with proper intervals, some of these extending over two to three weeks. The steer showed no symptoms of iodism whatever, even if the doses were increased to 15 grams per day and continued for two weeks without stopping; consequently the effect on the tumor was very little. The granuloma did not dry up after the treatment had been continued for three months, and neither this nor the fibrous tumor became smaller. Injections into the granuloma of a concentrated solution of iodide of potassium or of tincture of iodine only produced a small abscess at the place of injection, which would break open and a small amount of pus be evacuated. In spite of the daily doses of medicine the steer, which was rather poor at first, put on flesh and became fat.

Post-mortem, January 29, 1893.—The granuloma was covered with a thin layer of epidermis, and was not soft, but had become of a more fibrous character. A section through it proved it to consist of a stroma of fibrous tissue in which were embedded the larger and smaller centers of granulomatous tissue. This is of a dense character and does not contain pus. The surrounding parts of the tumefaction consisted of soft, white, fibrous tissue, with no traces of soft tissue. The lower maxilla was considerably swollen, the inner parts being spongy and containing numerous centers of soft tissue, but no pus. The lymph glands on the head were sound. No internal lesions. Carcass condemned.



252388

BEFORE TREATMENT—AFTERWARD CURED.



373406

BEFORE TREATMENT—AFTERWARD CURED.



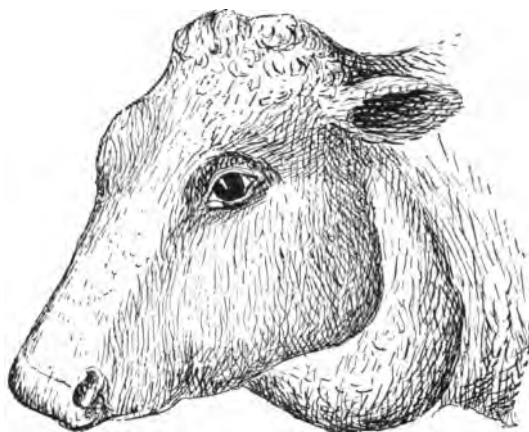
545764

BEFORE TREATMENT—AFTERWARD CURED.



45932

BEFORE TREATMENT—AFTERWARD CURED.



45982

BEFORE TREATMENT—AFTERWARD CURED.



534819

ANIMAL TREATED, BUT NOT CURED.



545512

BEFORE TREATMENT—AFTERWARD CURED.



39963

BEFORE TREATMENT—AFTERWARD CURED.

